Volume 93 Number 22

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

HOPE springs eternal in the human breast! A trite and only partial explanation for the renewed confidence with which industry looks ahead to the seasonally slack month of December. To hope must be added (p. 10) the weight of a upward-trending price structure, the inflation Frankenstein which the administration has brought to life (p. 15) and resumption of production by the country's leading automobile manufacturers. . . . Washington is convinced (p. 15) commodities are a buy, and certainly they must be if the dollar is to shrink to a 50 per cent shadow of its former self. . . . Extension of fourth-quarter prices on some steel products amounts to virtual increase (p. 37) as a result of early covering for fourth-quarter needs. Prices on some other products, including tin plate, wire, boiler tubes and pipe, have been lifted.

Auto Plants Toe the Line for 1934 Race

Ingot production for last week (p. 11) averaged 28.5 per cent over the country, a fractional increase, and in view of factors mentioned previously certainly will go higher next month. Last year at this time the rate was 17 per cent. . . . Leading producers of automobiles are jockeying their sales arguments, each attempting to out-maneuver the other (p. 14) for the juiciest portion of the 1934 market. Tonnage specifying of steel needs by these consumers is just beginning as the steel industry enters the second lap (p. 10) of its controlled recovery program. Extension of the steel code to May 31 has been granted by NRA, and the industry comes into a more favorable position (p. 20) to assert its rights.

Industrial Democracy Goes to Polls

With balloting for laborers' representatives completed at the "captive" coal mines, the slate for the United Mine Workers appears to be "in" by a landslide, although at one group of mines, votes were split (p. 11) three ways—for the United organization, for an independent union and for the employes' representation group. . . . Unemployed laborers and industry, between now and March, will benefit (p. 15) to the extent of about two billion dollars in government funds being poured out to prime the recovery pump. . . . With 123 industrial codes approved, the NRA administration is driving ahead (p. 12) toward an objective of 300 accepted codes by the end of the year.

Exports at Highest Level in Two Years

Notable improvement in the foreign trade balance in iron and steel products was registered on October, exports (p. 18) being at the highest level in two years, while imports dropped over 15 per cent from the September level. Depreciation of the dollar thus may be exerting its prophesied influence on export trade. . . . Plucking of a ripe trade plum envisioned by Russian business calls for special gloves (p. 13) in the form of credit arrangements. . . . An English steelworks (p. 51) is making a £500,000 addition to its equipment. . . . Producers in this country, however, continue (p. 53) to defer contemplated changes. and projects for government departments, such as the army and navy, comprise the bulk of equipment business.

Steel Leads 'Planes Over Nation's Airways

Steel, despite its weight, is coming into wider use in the field of air transportation, with the perfection of manufacturing methods and testing technique (p. 23) for the production of hollow steel airplane propellers. An ingenious magnetic test has been devised to reveal any internal defects in propeller steel. Fatigue testing of airplane shock absorber springs by means of a punch press is facilitated with a photoelectric cell arranged (p. 32) to stop the press if the spring breaks. . . . Welding machine operators are protected and spared troublesome headaches (p. 29) with the application of shields and ventilators to their machines. . . . Safety of linemen working on wood poles depends in large measure upon steel climbers attached to their feet. Thousands of them (p. 30) are made annually.

Code Extended, Prices Steady, Steel Outlook Brightens

IN HIGH spirits due to the improved outlook for business and with their code extended to May 31 with the blessing of the President and NRA Administrator Johnson, iron and steel producers last week embarked upon the second lap of their controlled recovery program.

First quarter prices immediately became the order of business, inasmuch as under the code books for the quarter are automatically opened Dec. 1. Although doubly justified by increased costs due to compliance with NRA and by the administration's stated policy of lifting commodity prices, indications are that advances will be comparatively few.

Tin plate has been put up $12 a ton, wire products $1 to $3, boiler tubes $4 to $6, pig iron in the East 50 cents to $1, while some advance in cold-finished and reinforcing bars is under consideration. But most of the heavy tonnage hot-rolled products apparently will be unchanged.

Regardless of whether prices are advanced or extended, specifications against fourth quarter contracts must be filed in time to permit shipment before Dec. 31; various producers have set various deadlines for the receipt of these specifications. Spot business for shipment in December on those products where advances have been filed will be entered at the new prices.

No official ruling has been made but it is believed that any producer at any time may ask a higher price without filing this price with the American Iron and Steel institute. Any reduction, however, requires a 10-day notice.

¶Consumers of steel in Toledo, O., seeing material for consumption in Michigan pass their doors for a lower delivered price under Commercial Resolution No. 13 than they themselves pay for a shorter haul, have filed a protest with the institute.

¶Also bearing upon hoodoo resolution No. 13 is the contention of a Michigan consumer of enameling sheets that the adjustment in the delivered price of sheets to the automobile trade should also apply to enameling sheets. This is now before the institute.

¶Commercial Resolution No. 31 makes the date of mailing a check the official legal date for payment.

¶Commercial Resolution No. 32 permits a producer to waive any interest charge of less than $1 on invoices paid by a purchaser in any month.

¶Commercial Resolution No. 33 waives the quarterly shipment clause in regard to track material purchased by railroads prior to March 1, permitting shipment to be made during the first half of 1934.

¶Commercial Resolution No. 34 also suspends the quarterly shipment provision on material for use on definite government financed projects.

¶Commercial Resolutions No. 8 and 20 have been amended effective Nov. 22, the former authorizing certain deductions in the delivered price for products that are delivered by other than all-rail transportation and the latter making the arbitrary switching charge in the Chicago district 60 cents per ton and in all other districts 50 cents, this amended resolution superseding resolution No. 7.

¶Although the iron and steel code provided that the 8-hour day does not become mandatory until the industry operates at 60 per cent, the official report of the institute to General Johnson proposing renewal of the code discloses that for all practical purposes the 10-hour day has been eliminated. In some cases wage rates of employes affected by the reduction in working hours have been increased 12½ per cent.

Of 237 companies in the industry, 213 reported to the institute that comparing Oct. 14 with June 17, the industry shows an increase of 92,155 or 28.3 per cent in employment and $9,293,000 or 32.1 per cent in wages. This showing is regarded the better by NRA considering that the industry was operating at 44 per cent on Oct. 14, compared with 47 per cent on June 17.

Specifically reporting for 147 identical companies for June and September, the institute finds the number of employes increased from 279,782 to 342,261, total wages from $22,074,466 to $26,632,308, and average earnings per hour 47.2 cents to 56.9 cents. These figures are for hourly piece work or tonnage employes.

¶A new book containing a revised list of uniform extras and deductions approved by directors of the institute on recommendaton of the committee on commercial matters will be issued to become effective Dec. 1. This will supersede the present list of extras issued two months ago.

Labor

INDUSTRIAL democracy came last week to "captive" coal mines of iron and steel producers in four western Pennsylvania counties—Fay-

POOLED RESEARCH DEVELOPS RAILMOBILE: For use on American railroads, to permit profitable competition with trucks and buses, these units are much like ordinary automobiles and trailers, but equipped with special pneumatic tires, the wheels being fitted with steel flanges to keep them on the rails. A ring of aluminum alloy secured to the wheel rim within the tire dissipates heat generated by the friction of rubber on steel rails, and also solves the safety problem, sudden deflation of the tire resulting in dropping the wheel only ⅝-inch. Fairbanks, Morse & Co., Chicago, Chrysler Corp., and Goodyear Tire & Rubber Co. co-operated in the development, with Fairbanks, Morse to distribute the cars

ette, Greene, Washington and Allegheny—when miners balloted upon representatives for collective bargaining.

The final unofficial count shows that the United Mine Workers elected representatives at 20 out of 29 mines. At some mines of the H. C. Frick Coke Co., a Steel corporation subsidiary, the Miners' Independent Brotherhood, a company union, won. Some elections are being contested.

Held under auspices of the national labor board of Washington, the election was the direct outcome of the agreement of iron and steel producers to bargain collectively with their employes. Already these employes enjoy every condition of the bituminous coal code.

Aggressive and highly-organized, the United Mine Workers was active at the polls. At every mine its six candidates included John L. Lewis, president, Phillip Murray, vice president, Thomas Kennedy, secretary-treasurer, and three local union officials.

Mine owners objected to the method of nominating opponents to the United Mine Workers' slate, claiming secret nominations would have been really representative, but acquiesced in the labor board plan. Voting lists were photostatic copies of payrolls of last August, prior to the strike. Thirty nationalities appear on these lists.

In treating with representatives elected, the final count to be announced at Washington, mine owners stand firmly on their agreement with the President and NRA Administrator Johnson—that the successful candidates represent their employes and not any organization. In other words, recognition of the miners' union was not an issue at the elections, nor will it be an issue in bargaining.

The unofficial count of last Wednesday's balloting follows:

Wheeling Steel Corp.'s Consumers Mining Co.: United Mine Workers, 479; other nominees, 20.

Inland Steel Co.'s Indianola mine: United Mine Workers, 182; other nominees, 1.

Weirton Steel Co.'s Isabella mine: United Mine Workers, 587; Miners' Independent brotherhood, 19; other nominees, 8.

Jones & Laughlin Steel Corp.'s Vesta Coal Co., Nos. 4 and 6 mines: United Mine Workers, 1145; other nominees, 2.

Crucible Steel Co.'s Crucible Fuel Co. mine: United Mine Workers 591; other nominees, 10.

Republic Steel Corp.'s Russellton, Pa., mine: United Mines Workers, 325; other nominees, 44.

Allegheny Steel Co.'s Allegheny Coal & Coke Co mine: United Mine Workers, 85; other nominees, 15.

United States Steel Corp.'s Sharon Limestone & Coal Co.'s Leesburg Nos. 3 and 5 mine: United Mine Workers, 395; other nominees, 107.

Pickands-Mather & Co.'s Mather mine: United Mine Workers, 761; other nominees, 5.

National Mining Co.'s National Nos. 1 and 3 mines: United Mine Workers, 795; other nominees, 83. National Mining Co. is also a United States Steel Corp. subsidiary.

Photo, Lincoln Electric Co., Cleveland

WHEN THE PIPE GOES OVER THE MOUNTAIN: This line, varying from 80 to 94 inches in diameter, reported the largest in the West, is being fabricated by the shielded arc process, a distance of 4½ miles from Bouquet canyon reservoir to Owens valley aqueduct near Saugus, Calif., part of Los Angeles water system

¶National labor board will supervise an election among employes of the Weirton Steel Co. at Weirton, W. Va., in the second week of December.

¶Amalgamated Association of Iron, Steel and Tin Workers at the election at the Ingersoll Steel & Disc Co., Newcastle, Ind., took a licking as bad as the United Mine Workers' victory was outstanding in western Pennsylvania. The result of this election, also under the auspices of the national labor board, was: For the Mutual Benefit and Representation association 295, for the Amalgamated association 70.

¶A further increase of 6.8 per cent in average hourly earnings in September, an advance of 1.1 per cent in average weekly earnings, a reduction of 5.2 per cent in average hours per week and an increase of 2.8 per cent in the number of persons employed are the findings of the National Industrial Conference board's monthly survey of employment conditions in the manufacturing industries.

Living costs increased only 1/10 of 1 per cent in October, being 2.5 per cent higher than in October, 1932, but 22.8 per cent lower than in October, 1929, also according to the board.

Canada

WINTON STEEL CO., subsidiary of a British company, has taken quarters at Sarnia, Ont., across from Port Huron, Mich., and will produce tin plate there, using a portion of the plant of the Dominion Alloy Steel Corp. For the present, black sheets will be imported from England but they may be rolled later at Sarnia.

As noted in STEEL last week, page 13, closing of the Canadian Steel Corp. tin plate mill at Ojibway, Ont., left Canada without a domestic producer of tin plate. Imports from Great Britain will be subject to the dump duty when production is started at Sarnia.

¶Canadian production of steel ingots and direct steel castings increased 25 per cent in October to 48,496 tons. In October, 1932, only 17,102 tons were made. The 10-month total for Canada is 315,325 tons for 1933 and 274,945 tons for 1932.

Pig iron output in Canada in October was 27,002 gross tons, compared with 6731 tons in October, 1932. The 10-month total for pig iron stands at 160,872 tons, against 102,950 tons a year ago.

Production

GAINING for the second consecutive week, steel production last week improved half a point to 28½ per cent. Due to the Thanksgiving holiday, a decline of at least several points is indicated for this week.

Pittsburgh mills advanced 1 point last week to 22 per cent. Two idle plants dragged down the average for the district, active Steel corporation and independent works holding at about 25 per cent. Eleven out of 60 steelworks blast furnace stacks were active.

Nearby Wheeling mills climbed 5 points to 51 per cent when 18 out of a possible 37 open hearths were on. Wheeling mills are now operating at the highest level since September, prior to the strike at Weirton. American Sheet & Tin Plate Co. Monday was to start its Laughlin Works at Martins Ferry, O., on a full basis.

For the second consecutive week, Chicago steel plants held at 29 per cent. Blast furnace schedules also

were steady, with 9 out of 36 steelworks stacks on.

Cleveland-Lorain district edged up 2 points to 48 per cent when National Tube Co. added an open hearth at Lorain. Corrigan, McKinney Steel Co. continued with eight open hearths on and Otis with three.

Youngstown mills lifted 1 point to 32 per cent, recouping all of the loss early in November. Another district to advance was New England, up 5 points to 75 per cent. A further gain of several points was indicated for this week, one plant scheduling 100 per cent operations.

Birmingham mills dragged along unchanged last week at 20 per cent, while Buffalo held at 32, with 12 open hearths on. Eastern Pennsylvania declined a half point to 17 per cent, but expects a slight gain in December.

American Iron and Steel institute estimate for last week was 26.9 per cent, compared with 27.1 per cent for the week ended Nov. 18.

¶Steel Co. of Canada, Montreal, Que., reports that while operations have declined from last summer's high, present volume still is considerably above a year ago, with its plants operating at nearly 35 per cent. Algoma Steel Corp. is adding 500 men at Sault Ste. Marie, Ont., next Monday.

Codes

GEAR manufacturers began operating under their code of fair competition Nov. 25, the code having been signed by the President Nov. 14.

Recommending the code to the President, NRA Administrator Johnson noted that at present there are approximately 5,000 employes in the industry, there has been an increase of 45 per cent in the number of workers in the four months from May to August compared with the first four months of the year, and that adjustments in the wage and salary classifications over minimum rates should increase payrolls approximately $120,000 over 1932.

The work week is 40 hours and the minimum wage, with some exceptions, 40 cents per hour. Code authorities are H. H. Kerr for the New England area, R. C. Ball for the metropolitan area, Richard Ferguson for the southern area, Howard Dingle for the central area, F. H. Fowler for the western area, and F. B. Drake for the Pacific coast area.

¶Code for the special tool, die and machine shop industry, approved by the President Nov. 17, took effect Nov. 27. The weekly limitation of 40 hours and the minimum wage of 40 cents for factory employes is expected to increase employment 25 per cent over the present 4700 and to lift payrolls approximately 33 per cent.

¶Wide differences of opinion as to the selection of code authorities for various branches of the trade marked the public hearing on the proposed code for the scrap iron, nonferrous scrap metals and waste materials trade at Washington, Nov. 22. Part of the iron and steel scrap trade was represented by the institute of Scrap Iron and Steel Inc., the remainder by independent representativs. Speaking for the institute, Phillip W. Frieder forecast that the number of employes will be increased 33 per cent over 1932, working hours would be decreased 25 per cent, hourly wages would be increased 50 per cent in the North and over 60 per cent in the South.

¶Code of the all-metal insect screen industry became effective Nov. 14. Dates set for hearings: Modification of cast iron soil pipe code, Dec. 4; roofing and sheet metal contracting industry, Nov. 28; steel plate fabricating industry, Dec. 5.

¶Swinging through the South, in much the same fashion that he went through the Middle West recently, General Johnson Friday conferred with the President at Warm Springs, Ga., taking with him codes for presidential approval. Before leaving, General Johnson ordered 177 codes now in various stages of completion rushed through before Dec. 31, bringing the list of codified industries up to 300.

¶Fifty-one per cent of typical exporting manufacturers consulted by *The American Exporter* report they have been compelled to raise prices because of increased costs under NRA, 33 per cent note no increases and 16 per cent very slight increases.

Financial

LUDLUM STEEL CO. preferred stock holders voted at the annual meeting at Pompton Lakes, N. J., Nov. 20, to cancel the accumulated dividend on the preferred stock, amounting to $19.50, in return for payment of $1 per share and the privilege of converting each preferred share into five shares of common.

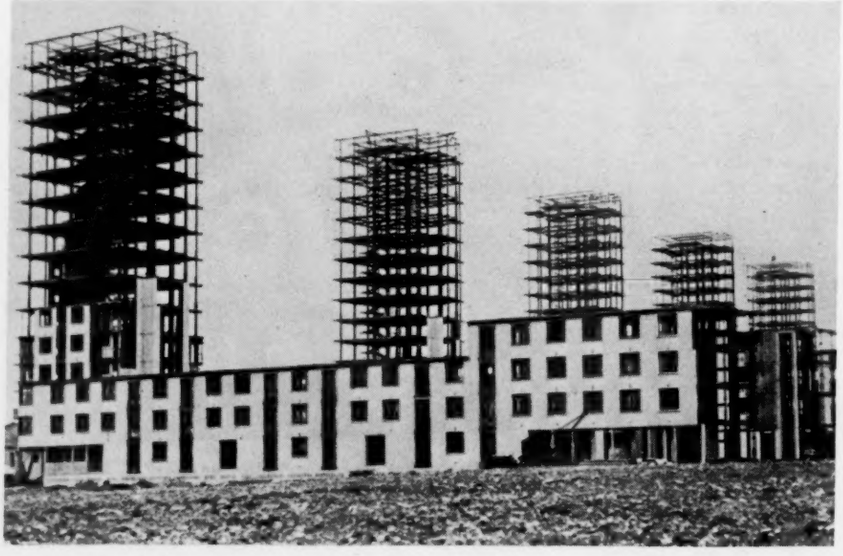
Holders of less than 20 per cent of the preferred and less than 10 per cent of the common indicated their disapproval of the plan or suggested changes. This leaves Ludlum with no bonds and presently no preferred stock ahead of the common stock.

¶Mesta Machine Co., Pittsburgh, has declared quarterly dividend of 25 cents on the common stock and regular quarterly disbursement of $1.50 on the preferred, both payable Jan. 1 to Dec. 16 record.

¶Eastern Rolling Mill Co., Baltimore, for the quarter ended Sept. 30 reports net loss of $68,167, against net loss of $63,611 in the preceding quarter, and loss of $71,759 in the corresponding period of 1932.

¶MacKinnon Steel Corp. Ltd., Montreal, Que., reports operating loss of $25,073 for the year ended last July 31, compared with operating profit of $29,959 in the preceding year.

¶Barium Steel Corp. organized under the laws of Ohio to produce stainless steel from scrap in the open hearth,



Wide World Photo

STEEL "APARTMENT SKYSCRAPERS" APPEARING IN FRANCE: Construction of 15-story dwellings in the suburbs of Paris marks another important development in European housing methods, the French heretofore having limited such buildings to five and six floors

last week offered 5000 shares of Class A convertible common stock at $45. The company states it has purchased a plant at Canton, O. Not only is the production of stainless steel from scrap possible, but further savings should accrue in the rolling and finishing process by the use of barium salts as a refining medium, the company's prospectus states. Lawrence K. Diffenderfer, of Canton, is president, Charles E. Middleton vice president, and Clarence F. Norsworthy secretary and treasurer.

¶National Steel Corp., sixth largest producer, reports its increased payrolls costs under NRA will be approximately $5,000,000 a year. It expects to share in the railroad buying program through production on its combination rail and structural mill erected at Weirton, W. Va., in 1931.

¶Allegheny Steel Co., Brackenridge, Pa., has declared the regular quarterly preferred dividend of $1.75, payable Dec. 1.

Statistics

SALES by independent sheet mills as reported by the National Association of Flat Rolled Steel Manufacturers were 79,141 tons in October, representing 24.4 per cent of capacity. Total production was 146,106 tons or 45 per cent, and total shipments 174,829 tons or 53.9 per cent.

¶October production of automobiles in the United States was 138,475 units, compared with 196,082 in September and 48,702 in October, 1932, this being the low point of the depression. In 10 months, output has been 1,811,242 units, compared with 1,203,768 in 10 months of 1932 and 1,370,678 in all 1932. Canadian production in October was 3682 units, compared with 5808 in September. Ten months total in 1933 is 60,371 units, compared with 78,942 for 10 months in 1932.

¶Other department of commerce statistics are: Babbitt metal production for October, 2,090,634 pounds, compared with 2,419,194 in September, and 1,573,273 in October, 1932; steel furniture for October, shelving orders, $385,186; fire proof safes, $289,827; lockers, $199,459; total orders for the business group, $1,619,450.

¶Final report for 1931 production of steel springs, not including wire springs, by the census of manufacturers: 98 establishments, 2938 wage earners, payrolls $3,633,836, total value of products $15,157,727, value added by manufacture $7,616,629.

BALLOT

NATIONAL LABOR BOARD ELECTION
NOVEMBER 22, 1933

HARMARVILLE MINE
CONSUMERS MINING COMPANY

INSTRUCTIONS
VOTE FOR SIX NAMES ONLY
You may write in names of any candidates not printed on Ballot

REPRESENTATIVES	Mark X Here
JOHN L. LEWIS Int. Pres., United Mine Workers of America	☐
PHILLIP MURRAY Int. Vice-Pres., United Mine Workers of America	☐
THOS. KENNEDY Int. Secy.-Treas., United Mine Workers of America	☐
P. T. FAGAN Pres., District No. 5, United Mine Workers of America	☐
WILLIAM PATTON Vice-Pres., District No. 5, United Mine Workers of America	☐
WILLIAM HARGEST Secy.-Treas., District No. 5, United Mine Workers of America	☐

REPRESENTATIVES	Mark X Here
JOHN CUNKO Loader	☐
JAMES ADAMSON Mine Supt.	☐
IKE RODGERS Blacksmith	☐
MARK HANNA Motorman	☐
E. ESTER Loader	☐
VASILIOUS BULEROUS Loader	☐

REPRESENTATIVES	Mark X Here
.....	☐
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WHEN CAPTIVE-MINE WORKERS ELECTED REPRESENTATIVES: The names at the left, in this sample ballot used in last week's voting, are those sponsored by the United Mine Workers of America. At the right are names of candidates of other unions, and independent nominees, proposed at various mines. Spaces below were provided for writing in names not printed on the ballot

Russia

CREDIT machinery for the proper handling of Russian commercial paper must be set up in the United States before Russian purchases expected to follow recognition will materialize in volume, according to C. J. Stilwell, vice president, Warner & Swasey Co., Cleveland. This company is now receiving inquiries from Russia.

No specific inquiries have resulted from the recognition of Russia, but reports in the iron and steel industry evidence expectation of sizable commitments for rails, track material, alloy steels, freight cars and locomotives.

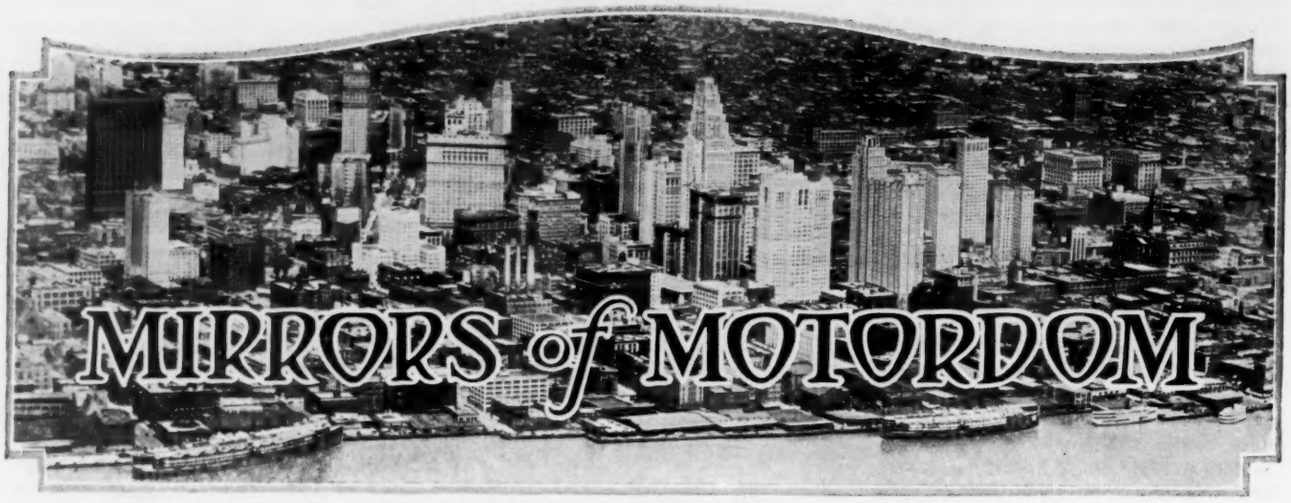
News Oddities

A SHIPMENT of pig iron has been dispatched from Port Colborne, Ont., at the southern end of the Welland canal to Vancouver, B. C., the routing being all-water via the St. Lawrence river, the Atlantic ocean, Panama canal and the Pacific ocean.

¶Out-of-work mechanics at Joplin, Mo., in the Jasper county relief agency, are transforming steel oil barrels into stoves for those in need. The cost is 35 cents per barrel-stove, accounting for material used. The labor is paid for by giving the mechanic groceries, clothing and fuel. More than 100 of these stoves are expected to be in service this winter.

¶Climax Molybdenum Co., Climax, Colo., recently used 110,500 pounds of dynamite in one charge, requiring two weeks to set, to break up 350,000 tons of ore. Probably 500,000 tons additional will slide or be easy to remove. Two weeks were required to permit fumes to dissipate.

¶Short of scrap, Japanese steelmakers are revising their practice to use more pig iron and iron ore and lessen their dependence upon scrap, of which 70 to 80 per cent is imported from the United States and the South Pacific islands and only 20 to 30 per cent originates in Japan. The Seitetsusho has a program of reducing its scrap requirement to 24 to 25 per cent.



New Chryslers Are Radical

• • •

GMC Tries To Hold Market

• • •

New Hudson, Essex Springs

DETROIT

CHRYSLER will introduce for 1934 a new six and an eight which will be the most radically streamlined automobiles yet put on a production basis in the United States.

Viewed head-on, the front of this series appears to be single piece of sheet steel, with a pronounced upward rake and broken only by the radiator grill and the two headlamps, which are drawn out of the front immediately above the bumper bar.

There are no front fenders. The hood extends, almost flat, across the full width of the car. Cowl and hood sides, pierced with horizontal louvers, drop vertically from the hood to shroud the top half of the front wheels and to serve as valances or skirts.

Running boards are eliminated, and the front doors are virtually extensions of the cowl sides, thus permitting the width of the running boards to be incorporated in the front seat, which accommodates three easily. When doors are opened, a step goes into position.

The cars are widest at the front door, and begin tapering toward the rear in true teardrop fashion. The body, however, is wide enough to cover the rear wheel and thus eliminate fenders. The rear falls away in almost the same degree that the hood rises from the radiator to the windshield.

This car, which will bear the Chysler name, was first disclosed in STEEL for Oct. 2. It has been given exhaustive tests at Walter P. Chrysler's shooting preserve near West Branch, Mich. In its design, no half-way measures have entered, and the opinion of those who have seen it is that it will be either the greatest hit in automotive history or the greatest flop.

Like others in the Chrysler line, this new job will have independently-hung front wheels. Plymouth and Dodge six, while improved, will not be radically changed at present; if streamlining goes over they may be revised in the spring. DeSoto will be streamlined in much the same manner as the new Chrysler, but is expected to retain its distinctive rounded radiator shell.

The Dodge eight will be discontinued, leaving the Plymouth, Dodge six, DeSoto and New Chrysler six and eight—the latter two practically identical except for size—to comprise the line for 1934. The Dodge six plant went down for inventory Nov. 24.

CHRYSLER, therefore, may be expected to push streamlining as its big sales point for 1934, while General Motors, already stressing its independently-hung or knee-type springs, will go only part way toward the teardrop style.

In fact, the issue of Chrysler streamlining vs. General Motors mechanics was drawn last week by the latter's preliminary advertisement of springs. It will be fully a month before Buick is shown and about show time before other lines are out.

But the unexpectedly brisk retail demand in the fall practically cleared General Motors dealers' floors. Chrysler and Ford, continuing longer in production on 1933 models, still have cars to deliver.

Hence the strategy of General Motors to announce its radical new design and tend to check retail sales until it again is in the market. Chrysler usually comes back vigorously, and may disclose its hand earlier than intended.

Buick was expected to begin assembling 1934 models last week, and to introduce them about Dec. 20. Adjudged the best-looking General Motors car by the recent customer research questionnaire, the Buick body is further refined. But the emphasis will be on the new springs.

Olds, farthest behind of any GMC unit, especially on the light six which is to be priced between Chevrolet and Pontiac, may have to go into the New York show with handmade models. The Olds is touted as the most interesting General Motors line for 1934.

Chevrolet last Monday began production of some parts for 1934, but will probably not start assembling before Dec. 10. Some delay has been encountered by this unit on the new type of springs.

LaSalle will break with a Cadillac tradition and bring out a straight eight in the $1800 class, in what has been the upper range of Buick. This new engine will be an L head.

Ternstedt, hardware subsidiary of General Motors, resumed last Wednesday.

FORD, meanwhile, is not going to take it lying down.

More than the rising cost of steel prompted the lighting of one blast furnace and four open-hearth steel furnaces at Fordson, and a revision of the present V-8 will shortly come off the line.

It is reported that the new model will be shown about Dec. 18, getting the jump on other low price changes. The new Fords will have a larger and longer body, many refinements in upholstery and fittings, and inbuilt window ventilators.

Ford springs will be refined, and the claim made that his transverse type tends to hold the car on an even keel, which is one of the merits of the new coil type.

The Lincoln division of Ford will offer two twelves, the same as this year.

General Motors' announcement of

(*Please turn to Page* 18)

WINDOWS OF WASHINGTON

Say Steel Is a Good 'Buy'
• • •
PWA Big Army, Navy Aid
• • •
Congress May Scan Prices

WASHINGTON

WHEN the professors fall out, as they have in Washington the past week, it behooves steel to become a bystander—an alert rather than an innocent one.

To steel as to other industries, gold and devaluation of the dollar and other facets of the monetary problem seem academic, but their repercussions will be felt ultimately even in the most minor market.

It is important to realize that the objective both of the group now surrounding the President and of the conservatives who have been brushed aside are identical: The raising of commodity prices and an increase in employment.

The means are as far apart as the poles but the end is the same. Even if the President bows before the storm—he always leaves the back door open—he will adopt some other program for effecting his purpose. It is the goal rather than the machinery that interests business, and the President has made this goal perfectly clear.

In fact, it is said to distress the President that his statements of policy and purpose are not accepted literally, and the professors are reported to explain that any failure of their program to date results wholly from the refusal of business to react logically to it.

Business apparently can chart its course from these two fixed points: A dollar devalued to about 50 cents in terms of gold, and a price level approximating that of 1926. In other words, for the long pull commodities are a "buy", Washington believes, and if business acts accordingly the demand to raise prices and increase employment will be generated.

NINETEEN TWENTY SIX prices of iron and steel don't mean much to Washington. It is doubtful if anyone high in the government could relate current quotations to 1926 other than to say that today's level is lower.

What 1926 connotes is a year that appears to be normal—a happy medium after the dregs of 1921 had been washed out and before the virus of 1929 had started working.

But 1926 means much to iron and steel. In terms of the iron and steel composite of this magazine, regaining 1926 means a lift of 21.1 per cent from the present index of $31.59 to the average of $38.26 for 1926.

Most of 1926, steel bars held at 2.00c, Pittsburgh, compared with 1.75c today; tank plates did not fluctuate far from 1.90c, or $4 per ton higher than at present. No. 10 blue annealed sheets averaged about 2.35c, wire nails 2.65c, tin plate $5.50, automobile sheets 4.25c, bessemer iron about $21 delivered at Pittsburgh, iron ore $4.40, heavy melting steel about $13 at Chicago, and so on.

As nearly as the President can make such a commitment, he is out to restore such levels. By the time they are achieved, the dollar may not be worth so much in gold as at present, and the administration prefers that wheat, corn, pork and other farm products beat steel and manufactures to the rise, but the objective is unmistakable.

IT IS growing appreciation that the President means what he says, even if his methods are unpopular, that is improving sentiment in Washington concerning business.

Merely to relay the reaction in Washington and not to make a forecast, it is believed that December will prove a good month even considering such handicaps as the year-end holidays and inventory-taking. There are some, in fact, who look for really substantial buying of all commodities in anticipation of an impending advance.

And as for spring, a really resounding comback is generally predicted.

Between now and March the $600,000,000 appropriated for civil works is scheduled to put 4,000,000 men at work. Rail and track fastening production is certain to be greatly expanded during the first quarter.

The lag in the PWA program has been detrimental to late fall and early winter business, but enough money has now been pushed out and sufficient projects matured to insure considerable demand for reinforcing bars, structural steel, pipe, piling and wire beginning in 30 days.

Considering all construction and relief projects, some two billion dollars will be expended between now and March, during the period most difficult for both the unemployed and for industry. In addition, over a billion is expected to be released from closed banks.

The fly in this ointment is the source of the funds. That, however, is more a problem for Washington than for the steel mills.

THE high commands of the army and navy are wearing smiles that won't come off, for under the public works program they have benefited enormously.

The temper of congress, reflecting that of the country, has been against large expenditures for these services. But last summer when the administration, refusing to take over the machinery of RFC because it had a Hoover origin, installed PWA under Secretary of the Interior Ickes the inevitable delays attending the creation of a new organization followed.

Neither the municipalities nor the states were in position to handle construction allotments speedily, but the army and navy were. Hence both of these services are in process of being rehabilitated beyond their fondest peacetime dreams.

The navy is translating $238,000,000 into vessels and is building toward treaty strength despite con-

gressional preference otherwise. Basking in this appropriation, stainless steel is being specified for those parts for which the navy has considered it ideal but has been reluctant to divert the money when so scarce for actual construction.

Army officers are rebuilding barracks, improving posts, proceeding with river and harbor work long delayed, and in general rebuilding.

The navy, however, is beginning to grumble that the iron and steel code does not necessarily compel uniform prices and it is increasingly reluctant to draw bidders' names out of a hat.

FROM the fact that the administration is a booster for higher prices, steel need not infer that all is clear sailing. There will be congress to reckon with.

Automobile executives are laying low at the moment, but they have not forgotten that the White House shook a 10 per cent reduction out of rail mills. Senator Couzens, who has a complex on the steel industry on account of rail prices—and it was from him that Railroad Co-ordinator Eastman got much of his education on rails—represents Michigan and is a former automobile executive. It will be interesting to see if he has anything to say on the floor of the senate concerning steel prices.

The biggest consumers of tin plate are the canners; the advance in tin plate prices has outrun those of other steel products; there is some talk in Washington that congress may be told how much of a burden tin plate is upon the worker's food.

Manganese will again be in the news, if from no other approach than imports from Russia in return for finished products will be discrimination against domestic mine owners.

Count it a certainty that labor will throw all its force behind a 30-hour work week bill. From NRA it will receive some support, as indicated by the recent statement of Division Administrator Whiteside that "if immediate improvement is not noticed it will probably be necessary —I speak unofficially, giving my own opinion—to reduce the hours of all industries, whether they are operating under codes or not."

The reason the steel code was extended without any adjustment of hours, despite the fact that the fixed date for a shorter week had lapsed Nov. 1 on account of slack operations, was the policy of NRA to treat all industry alike at a given time. In other words, legislation will be an easier approach to a 30-hour week than a series of contests with every codified industry.

Apparently steel need fear no heavier burden of taxation. The excess profits and dividend taxes automatically expire Jan. 1 and the capital stock tax July 1 as a result of the repeal of prohibition. Thus far there has been no suggestion of additional taxes to meet PWA and relief expenditures other than the substitution of liquor taxes for the levies about to lapse.

It would be an extraordinary situation, too, if no senator or representative failed to get up and demand that the antitrust laws be enforced, even if this required amending the recovery act.

SPEAKING of complexes, Secretary of Labor Perkins has one on barbed wire.

Rarely does she mention the steel industry without making some reference to this product. To barbed wire and "automobile plates" she ascribes credit for the big rise in steel production last summer.

A recent mention by the President of barbed wire in an analysis of the situation in steel indicates the source of his information.

Another point Miss Perkins stresses frequently is the necessity for reading statistics for the long pull. In ascertaining a trend, a week or even several months are not conclusive, she maintains. Sometimes several years are required to determine trends, she insists.

While this doctrine was enunciated before the fall slump in business and has been part of the secretary's thinking for some years, it has been comforting in explaining away the decline.

There will, however, be fewer statistics to read inasmuch as all government statistics must now go through the sieve of the central statistics board, a special body set up in the department of commerce building adjacent to NRA but literally not a part of it.

Prior to any dissemination of government statistics, especially those of an interpretative character, they must pass through this board. Some federal reserve board statistics no longer are given out. Coupled with the now-withdrawn muzzling order of Acting Secretary Morgenthau of the treasury, the tendency toward censorship is evident.

A few more suppressions and the government for all practical purposes will have resurrected the wartime public information bureau.

This coming congress, incidentally, may see Miss Perkins busy with congress in an effort to lay the groundwork for her pet theories. During the summer she was ardent in championing the cause of job insurance and urging new divisions in her department to create and enforce new standards for labor.

Recently she has been doing less talking and more backstage work of the character necessary to gain legislative support. The necessity for winning organized labor's support in congress and persuading labor leaders that such projects are not pure "uplift" but a real benefit to the hardy toiler is the reason.

FOR the time being, Henry Ford has completely passed out of General Johnson's life. He no longer is "any concern of mine," was the general's swan song on this controversial subject on his way south.

This is the biggest tail feather yet to be plucked out of the blue eagle. It sets a precedent that so long as any manufacturer abides by the code for his industry he need not sign up or display the eagle.

But the general has other fish to fry. He continues to edge in on code authorities, and little by little industrial self-government is passing out.

It is only by setting up provisions for labor representation on labor divisions of code authorities and getting a speedy OK at Washington that any industry can prevent its code being interpreted and enforced either by the 26 department of commerce district offices or by regional offices of the national labor board.

Steel Beer Barrel Makers Organize Association

Associated Manufacturers of Steel Beer Barrels, with Glenn W. Bittel, commissioner, at 1152 Hanna building, Cleveland, has been organized with the following charter members: Murray Corp. of America, Detroit; Thermo Barrel Corp. of America, Philadelphia; Ingersoll Steel Tank Co., Chicago; Pressed Steel Tank Co., Milwaukee; A. O. Smith Corp., Milwaukee; Buhl Stamping Co.. Detroit; Solar-Sturges Co., Melrose Park, Ill.; Motor Wheel Corp., Detroit; National Enameling & Stamping Co., Milwaukee; Firestone Steel Products Co., Akron, O.

On the executive committee are: Charles H. Widman, chairman, Murray Corp. of America; Oscar J. Vogl, first vice chairman, Ingersoll Steel & Disc Co.; H. J. Fishbein, Thermo Barrel Corp. of America; B. F. Bart, A. O. Smith Corp.; T. D. Buhl, Buhl Stamping Co.; and R. P. Dieckelman, Pressed Steel Tank Co.

An aggressive program to further the steel beer barrel industry will be launched shortly. Steel producers and other accessory material manufacturers will be eligible to associate membership.

According to Mr. Bittel, who has been active in association work in Cleveland, the steel beer barrel is entering on an era of wide popularity and will rapidly replace barrels of less durable, less sanitary and less attractive materials.

Industrial Men in the Day's News

Evans Ward, President, Russell, Burdsall & Ward Bolt & Nut Co.

Inheritance, training and experience qualify him for directing this pioneer manufacturer.

Graduate of Yale, he started with the company in 1907, has been there ever since that time.

He was active in the development of American standards for bolts, nuts and rivets.

SUCCEEDING his father, the late William L. Ward, to the presidency of the Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., Evans Ward is in position to carry on a fine tradition of leadership in the industry, for which he is well qualified, not only by inheritance but also by training and experience.

Graduating from Yale university in 1907, he immediately became affiliated with Russell, Burdsall & Ward, continuing with the company ever since.

After several years at the Rock Falls, Ill., plant, he became general manager of the company in 1914 and vice president in 1923. In addition to his new responsibilities, noted in the Oct. 9 issue of STEEL, Mr. Ward will continue as general manager.

Mr. Ward is vice president of the American Institute of Bolt, Nut and Rivet Manufacturers, and a member of the code committee. He was active as a member of the committee on development of American standards for bolts, nuts and rivets.

His brother, Warren L. Ward, who succeeds him as vice president, has been with the company 25 years, and since 1917 has served as assistant sales manager. He likewise is a graduate of Yale university, class of 1908.

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Roy M. Welch has been named assistant to Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown, O. Formerly he was assistant secretary and assistant treasurer. R. C. Steese, Youngstown, has been elected a member of the executive committee of the board of directors.

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E. R. Wegener has been appointed Michigan representative of the cold-drawn bar steel division of the Western Automatic Machine Screw Co., Elyria, O., with headquarters at 510 Stephenson building, Detroit.

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L. T. Miller, for the past eight years director of purchases for the Detroit Steel Products Co., Detroit, is now associated with the sales department of the Standard Sanitary Mfg. Co., in that city. He will handle sales of pipe, valves and fittings.

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William F. Dalzen, for years associated with the Michigan Tool Co., Detroit, has been named vice president, National Broach & Machine Co., Detroit.

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Charles Korp, formerly shop superintendent, Okmulgee Gas Engine Co., Okmulgee, Okla., is now sales representative for the Inland Iron Works of that city.

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Robert G. Scott has been appointed vice president of Revere Copper & Brass Inc., in charge of the Taunton-New Bedford division, with headquarters at Taunton, Mass. He has been associated with the Revere organization since its inception in 1929, and lately has been with the executive offices in New York, active in special sales engineering work.

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Carl F. Scheid, hitherto assistant district sales manager of the Milwaukee branch of Columbia Tool Steel Co., Chicago Heights, Ill., has been appointed sales manager.

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C. F. Cate has been named representative in New Mexico for the Louis Allis Co., motor manufacturer, Milwaukee, with headquarters at 212 North Third street, Albuquerque.

Robert B. Soderberg will represent the company in Connecticut, with offices at 196 Palm street, Hartford.

N. O. Lawyer has joined the company's New York sales office, 50 Church street.

G. W. Conner is now with the Cincinnati sales office, 1124 Chamber of Commerce building.

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E. N. Carlson, recently affiliated with the Corby Supply Co., St. Louis, and for many years previously with Joseph T. Ryerson & Son Inc., is now associated with Guy H. Rumpf, Railway Exchange building, St. Louis, handling a general line of machine tools, welding equipment, industrial tractors and trucks, and steel. He represents the following companies: Bryant Machinery &

Thomas W. Pangborn

President, Pangborn Corp., Hagerstown, Md., who, as noted in the Nov. 20 issue of STEEL, has been elected president of the National Founders association

Engineering Co., Mercury Mfg. Co., Acme Steel Co. and Detroit Seamless Steel Tube Co.

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William G. Yantis, vice president, Shapleigh Hardware Co., St. Louis, for the last 32 years, has been elected president, succeeding Richard W. Shapleigh, whose death was noted in the Nov. 20 issue of STEEL.

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Harry S. Braman, formerly superintendent of blast furnaces, Youngstown Sheet & Tube Co., Youngstown, O., has been elected president of the Western Reserve Brewing Co., Warren, O.

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C. H. Paul, Mackintosh-Hemphill Co., Pittsburgh, is now secretary and treasurer of the Pittsburgh Foundrymen's association, Pittsburgh, succeeding W. J. Brandt in that office. Other officers continue unchanged.

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Fred O. Smith, vice president, Vulcan Iron Works, Wilkes-Barre, Pa., has assumed direction of all sales activities of the company. He began work with the company as an apprentice and worked his way up through the organization to his present executive position.

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J. E. Daily, general manager of the Steubenville, O., works of Wheeling Steel Corp., has resigned to become manager of the Chicago district plant of Youngstown Sheet & Tube Co.

Exports Rise, Imports Fall

A striking improvement in the foreign trade balance in iron and steel is reported for October by the iron and steel division of the department of commerce.

Exports went to the highest level in more than two years, when they totaled 164,755 tons, compared with 108,799 tons in September, and only 41,226 tons in October, 1932.

Imports dropped from 55,706 tons in September to 46,673 tons in October. Last October 33,693 tons of iron and steel were imported.

Mirrors of Motordom

(*Concluded from Page* 14)

its knee-action type springs has smoked out the plans of Hudson-Essex, which calls its innovation the "axleflex" type.

The front axle, shock absorbers, splayed springs and present steering mechanism are retained, but a vertical flexibility is given to each independently-mounted front wheel. Buyers of any Hudson-Essex model in 1934 can have their choice of the conventional or the "axleflex" type.

The new Hudson-Essex line will be shown to dealers in Detroit Dec. 5, 6 and 7, and the advertising campaign will start shortly after that. This coming year the supersix drops out of the Hudson line, it is understood.

A complete redesign of all bodies will be featured, especially on the Terraplane 8 to make it a more vigorous contender in the low price field. Detroit reckons the Ford 8 and Terraplane 8 as the fastest cars on the market.

Hupp is another manufacturer to watch for 1934, its teardrop designs for the six and the eight being almost as radical as Chrysler.

WITH Buick getting under way, the official start on 1934 models is being made.

Most other manufacturers have some departments at work on various parts, but for a majority assembling will not start until early December. There will be fewer showings than usual before the New York show which open Jan. 6.

This week some substantial releases for steel and other materials are expected. It is also believed that the first real test of prices under the steel code is at hand, inasmuch as material for some parts could not be anticipated when manufacturers were building up inventories.

Automobile manufacturers are not partial to the steel code, but no concerted effort against prices is probable at this time, especially since rising iron and steel prices are being cited as Exhibit A in behalf of higher f.o.b. prices for cars.

A. P. Sloan Jr., president of General Motors, stated last week that General Motors cars will be advanced 15 per cent for 1934. This was a stiffer rise than Detroit expected, but it is expected to apply more to medium and high price cars than to the bottom of the market. Mr. Sloan puts the added burden of codes as $30 per car.

The effects of the die and tool makers' strike still are evident. The delay in getting new models under way is about three weeks, and more handmade cars will be on the floor of the New York show than in many a year.

Another sequel is difficulty with dies. With the best of intentions, outside die makers have not been able to rally experience to their aid, and it is reported that new dies on some important body parts have been cracking.

October production of passenger cars and trucks in the United States is officially placed at 138,475 units by the department of commerce. This compares with 196,082 in September, but is almost three times the 48,702 units of October, 1932, which was the poorest month since the department began collecting statistics in 1921.

November production has not topped 50,000 units by very much. December will show a substantial increase, probably well over 100,000 units.

Died:

CASSIUS W. EVANS, 40, superintendent of coke plants, Wheeling Steel Corp., Wheeling, W. Va., at the William Penn hotel, Pittsburgh, Nov. 18, after attending a meeting of the Eastern States Blast Furnace and Coke Oven association there Nov. 17.

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George W. Best, 79, vice president, Sloan Valve Co., Chicago, in that city, Nov. 16.

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W. B. Kunhardt, 75. chairman, Carpenter Steel Co., Reading, Pa., at his home in New York, Nov. 23.

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Morton L. Byers, 65, president, West Virginia Malleable Iron Co., Point Pleasant, W. Va., at his home. East Orange, N. J., Nov. 23.

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Harry E. Haldeman, Cleveland representative, the Chas. Taylor Sons Co., refractory manufacturer, Cincinnati, at his home in Cleveland, Nov. 14.

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George G. Britton, 69, president, Interstate Foundry Co., Anniston, Ala., at his home in that city, Nov. 14. He was also head of the Anniston Interstate & Roofing Co., a director of the Commercial National bank, and a trustee of Howard college endowment fund.

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Dr. George C. F. Williams, 76, president, Capewell Horsenail Co., Hartford, Conn., at his home in that city, Nov. 15, after a long illness. During his 40 years' association with the company it had been reputed to be the world's largest producer of horseshoe nails.

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Ivor J. Davies, 58, general superintendent of the passenger division, Pressed Steel Car Co., Pittsburgh, at Pittsburgh, recently. Born in Huntington, W. Va., he was active in building of the first steel cars in the Pressed Steel Car Co.'s plant at Pittsburgh.

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Albert V. Conradt, 65, one of the founders of the Kokomo Sanitary Mfg. Co. and the Continental Steel Corp., Kokomo, Ind., at his home recently in that city. He had just returned from Pittsburgh where he attended a meeting of the American Radiator

& Standard Sanitary Corp. board of directors, of which he had long been a member.

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C. B. Houck, president, Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., at his home in Hazelton, Pa., Nov. 21.

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Paul H. Dorsch, 50, superintendent of the tool department, A. O. Smith Corp., Milwaukee, at his home in that city, Nov. 18, of carbon monoxide poisoning.

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Herbert K. Oakes, 60, vice president, Franklin Steamship Co., Cleveland, and former vice president, Bethlehem Transportation Co., at his home in Cleveland, Nov. 16, after a year's illness. Previously he was vice president in charge of operations for the Cambria Steamship and the Mehoning Steamship companies, directtor of the Great Lakes Engineering Works, Detroit, the Lake Carriers association and the Great Lakes Protective association.

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Stephen H. Velie, 72, vice president and director, John Deere Plow Co., Moline, Ill., at his home in Kansas City, Mo., Nov. 16, after a short illness. Educated in Moline and a military school in Michigan, he entered employ of the plow company at the age of 19, and in 1892, when he went to Kansas City, he had been made secretary-treasurer of the company, becoming president and general manager in 1904. He retired from active management in 1915. He was widely known in the fields of motor car manufacture and farm machinery distribution, as well as being a nationally known sportsman.

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Henry H. Westinghouse, 80, chairman of the board of Westinghouse Air Brake Co., Wilmerding, Pa., at his home in Goshen, N. Y., Nov. 18, after a long illness. He entered employ of the air brake company in 1872, three years after its organization by his brother, the late George Westinghouse, who founded the Westinghouse Electric & Mfg. Co. In 1914 he became president of the company and was elected chairman of the board a year later. Mr. Westinghouse was inventor of the single-acting steam engine and subsequently organized the Westinghouse Machine Co. for its manufacture. In 1885, associated with William L. Church, Walter C. Kerr and I. H. Davis, he formed Westinghouse, Church, Kerr & Co., which marketed the engine. He was associated in an executive capacity with a number of Westinghouse affiliated and subsidiary companies in Canada and foreign countries. He was a member of the United States chamber of commerce, National Industrial Conference board and the Merchants Association of New York.

He Finds Rhyme In Steel's Grime

FROM the rust-brown hollows of the Mesabi to the peaks of metropolitan skyscrapers "there is more poetry in the processes of iron and steel than in any one thing at which man is gainfully occupied."

A great poet did not discover this truth, but a former general superintendent of furnaces, Noel R. Beddow, Woodward Iron Co., Woodward, Ala. And he told the Poetry Society of Alabama so at a meeting in that city last spring.

"Steel offers a vast new field for the modern poet, in its color, dangerous action, spectacular beauty, exceptional human interest and magic," he said.

"True, it is difficult to approach, because of its immensity, but in view of its importance it cannot be overlooked by present-day poets who strive for a salubrious realism in contrast to pale Victorianism."

However, he takes to task the poets who exaggerate the grim elements in steelmaking. He read a poem written by a noted socialist, each stanza closing with the ejaculation that steel is made from "smoke and the blood of men."

Safety in Modern Mills

"During my 27 years' experience in the steel mills," he said, "I have not seen or heard so much of the gore of men as in this poem. On the contrary, statistics from safety departments will prove that the steel worker is far safer occupied with his duties in the mills than outside.

"A great deal of the unrest and dissatisfaction in the mills of the United States today is due to the foreign laborers. They were born under oppression, and lived under oppression until they acquired the means to escape their native land, to secure a new home within our country. Here we have taken them into the mills and taught them how to do the work, but not always how to be true, faithful and loyal citizens.

"Without steel and its alloys, civilization and the modern man would not, and could not, have reached the rapid strides he has attained in the past 300 years. . . There would be no agitation for a 30-hour week, and man would be most fortunate, if after long tiresome hours of labor, he could secure the barest necessities of life.

"Steel is the essential framework, the arteries and heart of present-day civilization. It accounts for about one-fourth of our total industry, and has come to be numbered with the indispensable to man's life and well being, along with grain and textiles.

"Although it is not edible, without steel it would be difficult to grow, mill or transport our foodstuffs, or to spin thread with which to weave and distribute our clothing, to protect ourselves from the rigors of the winter. It is the youngest of these giants, the one more than all the rest that has made possible industry and mental progress."

In a lighter vein, he told his audience why a blast furnace is generally given a woman's name.

" 'She' is always the term in which the iron manufacturer refers to a blast furnace, due in no great part to the fact that nothing made by man so resembles a woman in its mood and temperament as a blast furnace. It can without the slightest provocation apparently do the most astonishing things and is as temperamental as a prima donna. . . Ninety-nine times out of a hundred when the cause of all this strange action is ascertained, some man is at the bottom of it."

Likened to Dante's Inferno

Passing along in his poetical survey of the blast furnace:

"The cast shed crew moves silently with precision from place to place, to see that these flowing streams are kept within their runners, the whole beautiful scene reminding one of Dante's Inferno. You wonder if, in his conception of the Satanic imps ministering to the flames of hell, he had not at sometime seen a blast furnace as she was relieved of her iron and slag."

He read for the poets a number of poems written about iron and steel, and criticized some of them for too extravagant flights of fancy. One which appealed to him was written by Louise Grenshaw Ray, of Birmingham entitled "Blast Furnace":

"Great domes of dulling red like minarets,
Rise among the stacks.
Rattling trains of gondolas come in
With loads for ten-ton skips
That roar up steep inclines
To stoke a towering furnace.
Beneath them, tapping the source with drills,
Men make a run
And let an orange stream
Of molten ore and slag gush forth.
Runways on the earthen casting-floor,
Tended by sweating Satans
Who shape the sand and mud
Like potters moulding vessels,
Take the iron to a giant ladle.
Slag rushes in fiery rivulets
Down the crater of a granite-colored pit.
Pig-moulds await the metal,
Revolving like a strand
Of crimson gems.
When cooled, the bars are roughly brown,
Yet ugly pig-iron,
Sire of steel,
Is all-important to a clean blue rail.
Defiant whistles herald a blast
Like bombs exploding,
And leaping flames kindle the evening sky
With Northern Lights."

EDITORIAL

Steel Is in Strong Position To Assert Its Rights

RENEWAL of the term of the steel code until May 31, 1934, represents a significant step in relations of the iron and steel industry with the government under President Roosevelt's proposed "partnership." The passing of the 90-day probationary period marks the end of the first phase of industry's participation in this noteworthy experiment.

Looking back to the beginning of this relationship in the light of what we know today, we see an unbroken series of serious obstacles, the majority of which the industry has met and overcome in a highly satisfactory manner.

At the time the national recovery bill was being debated in congress, the steel industry was poorly organized. By the time the bill was passed, the industry leaders were aware of the necessity of preparing a code, but the facilities for handling such a great undertaking were inadequate. However, under the stress of the emergency, leadership developed quickly and the full force of the industry was directed to the task of perfecting a suitable code. To their great credit, the industry's leaders did not limit their efforts to a code that would merely satisfy NRA minimum requirements, but set out to draft a pact which would introduce needed reforms.

Experience in Trial Period Proves That Judgement of Code Drafters Was Sound

The resultant document of 12,000 words was and still remains the most outstanding code that has been submitted to the government under NRA. Subjected to the close scrutiny of objectors within and without the industry and viciously attacked from all sides by selfish interests, it was approved and signed by the President substantially as it was first drafted. That it has survived the 90-day trial period with no serious objection to its major provisions is striking proof of the care and intelligence with which it was drafted.

In the negotiations with the government occasioned by the preparation and administration of the code, the leaders of the steel industry have gained much valuable experience. In the process of "give and take" there were several occasions when the temptation to throw the entire project overboard in disgust ran dangerously high. At times the apparent blindness of government officials to the constitutional and moral rights of industry came near to precipitating an open break. On more than one occasion the steel industry's representatives were the victims of unethical acts on the part of government officials. Throughout the entire period the industry was constantly under a barrage of unfavorable public criticism.

In spite of this unfair and unnecessary bulldozing on the part of the government, the steel industry steadfastly stuck to its determination to go as far as it reasonably could in co-operation with the President. Because of this attitude, the iron and steel industry now stands before the public as the first large industry that has had extensive experience in dealing with the government on basic problems. It is the industry which above all others has endured the greatest hardship in the hope that the government's program might succeed. It is the industry which has assumed the greatest monetary burden. It is one of the industries in which full adherence to the short-hour week entailed the most difficulties.

Steel Has Demonstrated Willingness to Co-operate; Now Deserves Share of Benefits

Having thus demonstrated its willingness to make sacrifices for the public good, the iron and steel industry now is in a strong position to bargain for, and, if necessary, to fight for its rights. Proceeding cautiously through the probationary period the leaders of the industry unquestionably were using good judgment when they refrained in the face of provocation from forcing some of the troublesome issues out into the open.

But from now on the industry will be justified in taking a more positive stand in regard to many of the questions which remain unsettled. Having put its house in order, the steel industry should hesitate no longer in placing before the public its position on all important matters.

Right now it is confronted by a difficult problem in connection with the elections in the captive mines of Western Pennsylvania. The public has been given a distorted picture of the situation. The steel industry has gone to the very limit of its ability to co-operate with the government. Before it yields to further compromise it should reveal the true state of affairs to the court of public opinion.

The steel industry has contributed its full share and more to the cause of recovery. The time is near at hand when it should share in the benefits. From now on its leaders, once convinced their cause is just, should strike out boldly for their rights.

THE INDUSTRIAL DIAL

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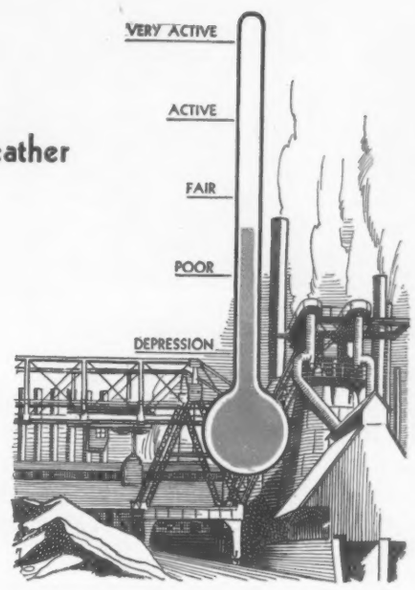
EVENTS of November lend strength to the belief that business is in the valley of the decline which began last August, and is headed toward higher ground on the other side. The signs are not as positive as they might be, but the outlook is decidedly more encouraging than it was at the beginning of the eleventh month.

If it is true that business has struck bottom in this present cycle, then we are warranted in comparing the current record with that of other recent turning points. The following is a comparison of several important barometers:

	July, 1932	March, 1933	July, 1933	Nov., 1933
Industrial production index	58	60	100	*75
Steelworks operating rate, %	14.9	15.5	58.9	*29.0
Automobile output (1000 cars)	109.1	117.9	233.0	†50.0
Machine tool order index	25.0	13.0	54.0	‡67.1
Foundry equipment order index	18.7	9.8	48.8	‡42.5
Freight car loadings (weekly average, 1000 cars)	508.0	464.8	621.0	*583.8

*Estimated. †Estimate for November, an "off" month. Production in October was 138,000 units. ‡October index numbers.

Industrial Weather



TREND:

Uncertain

The foregoing, with rough approximations for November, shows that in spite of the distressing recession from the peak of last July, industry has retained a fair proportion of its gains from the low points of March, 1933 or July, 1932. In fact, comparisons of the month of November, 1933 with any month of 1932 indicate that industry, on this coming Thursday of Thanksgiving, has much for which to be thankful. For instance, the steel operating rate for November, coming as it does at the end of a four-month decline, still is higher than the rate in the best month of last year.

The current position of business is all the more remarkable because of the peculiar circumstances with which it is surrounded. Such business as exists today has been won in the face of a paralyzed credit system, a flight of money to foreign shores, and uncertainty as to national monetary policy. It also has been achieved at a time when industry was deeply immersed in the intricacies of the NRA, some features of

The Barometer of Business

Industrial Indicators

	Oct., 1933	Sept., 1933	Oct., 1932
Pig iron output (Daily average, tons)	43,699	50,264	20,795
Machine Tool Index	60.1	55.7	28.4
Finished steel shipments (tons)	572,897	575,161	*
Ingot output (Daily average, tons)	81,225	88,884	41,810
Dodge Bldg. awards in 37 states (sq. ft.)	15,534,700	13,380,700	11,033,700
Automobile output	142,157	201,890	51,625
Coal output, tons	29,656,000	29,500,000	32,677,000
Business failures; number	1,206	1,116	2,273
Business failures, liabilities	$30,581,970	$21,846,906	$52,869,974
Cement production, Bbls.	.....	5,638,000	7,939,000
Cotton consumption, bales	503,873	499,486	501,893
Car loadings (weekly average)	651,411	640,910	633,512

*Statistics not available.

Financial Indicators

	Oct., 1933	Sept., 1933	Oct., 1932
25 Industrial stocks	$127.86	$136.44	$90.29
25 Rail stocks	$31.23	$38.51	$22.49
40 Bonds	$72.77	$74.26	$66.57
Bank clearings (000 omitted)	$17,780,669	$16,665,333	$19,795,452
Commercial paper rate N. Y. (per cent)	1½	1½	2
*Commercial loans (000 omitted)	$8,593,000	$8,540,000	$6,164,000
Federal Reserve ratio, per cent	65.5	66.1	61.9
**Railroad earnings	$60,936,370	$60,978,216	$48,947,045
Stock sales, N. Y. Stock exchange	39,379,082	43,319,334	29,187,659
Bond sales, par value	$232,922,600	$231,353,500	$189,254,100

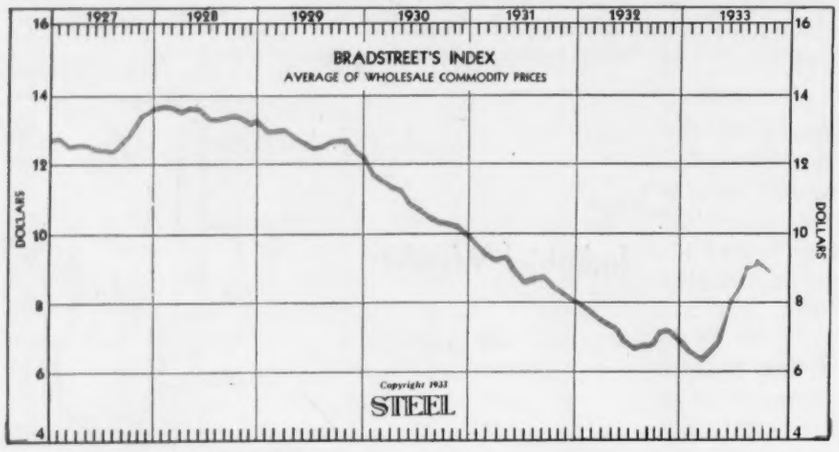
*Leading member banks Federal Reserve System.
**September August and September respectively.

Foreign Trade

	Oct., 1933	Sept., 1933	Oct., 1932
Exports	.....	$160,000,000	$153,000,000
Imports	.....	$147,000,000	$106,000,000
Gold exports	.....	$58,281,000	$57,000
Gold imports	.....	$1,544,000	$20,674

Commodity Prices

	Oct., 1933	Sept., 1933	Oct., 1932	Monthly av. 1913
STEEL'S composite average of 14 iron and steel prices	$31.59	$31.30	$29.32	$26.32
Bradstreet's index	$8.84	$9.05	$6.97	$9.21
Wheat, cash (bushel)	98c	$1.03	66c	92c
Corn, cash (bushel)	57c	64c	42c	51c
Petroleum, crude (Bbl.)	98c	98c	90c	$2.50



	1933	1932
November 1	$8.84	$6.96
October 1	9.05	7.17
September 1	9.00	6.95

which unquestionably have discouraged the placing of new business. Furthermore, this showing was made in a period of serious labor trouble, which in branches of certain industries throttled activity to a marked degree.

Where Business Stands

Monthly Average, 1932—100

	Oct., 1933	Sept., 1933	Oct., 1932
Steel Ingot Output	193.5	211.8	99.6
Pig Iron Output	184.5	212.1	87.8
Freight Movement	119.9	118.0	116.7
Building Construction	119.5	102.9	84.6
Automobile Output	119.1	169.2	43.3
Wholesale Prices	124.5	127.5	98.2

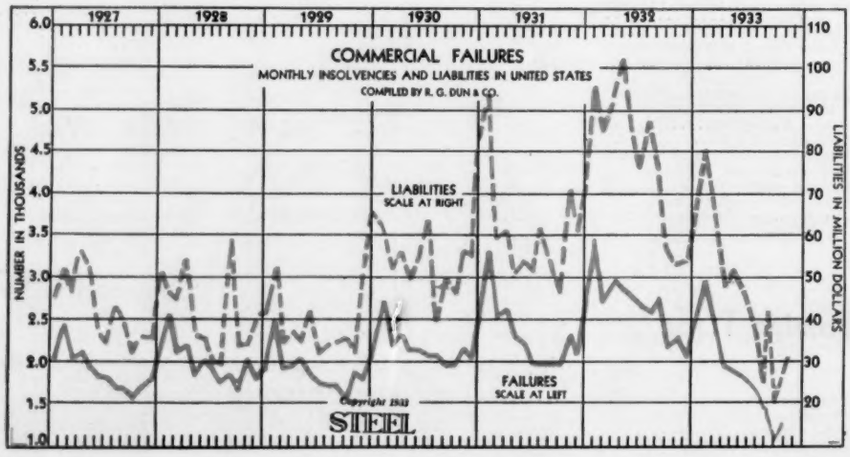
If the present state of industry represents the low point attainable under these numerous handicaps, what would happen if the problems of credit, monetary policy, labor, etc. should be solved gradually in the early future? Perhaps the obvious answer to this question is the basis of the present more buoyant tone of business sentiment.

Commodity Price Index Off Slightly; 27 Per Cent Above Last Year

The strong recovery of commodity prices in mid-October was not sufficiently high to offset the wide recessions occurring the first two weeks and Bradstreet's index of commodity prices declined for the second time since March, when the low point of the depression was reached. On Nov. 1 the index stood at $8.84 compared with $9.05 on Oct. 1, a drop of 2.2 per cent. During September the index revealed the first sign of weakness with a decline of 0.2 per cent, however, despite these two setbacks the current index is 27 per cent above the Nov. 1, 1932, figure.

October Commercial Failures Down 46.9 Per Cent From Last Year

Business failures in the United States during October continue at low ebb. According to Dun & Bradstreet Inc., there were 1206 insolvencies in October, involving a total indebtedness of $30,581,970. While the current report does not reveal as low a business mortality as in the preceding month, it is the lowest record for October since 1920 when only 923 failures were reported. In October, 1932 there were 2273 failures, with liabilities of $52,869,974.



Number

October, 1933	1,206
September, 1933	1,116
October, 1932	2,273

Liabilities

October, 1933	$30,581,970
September, 1933	21,846,906
October, 1932	52,869,974

Illustrations on this page courtesy of Bureau of Standards and Bureau of Aeronautics

BY HAMILTON FOLEY
Pittsburgh Screw & Bolt Corp.

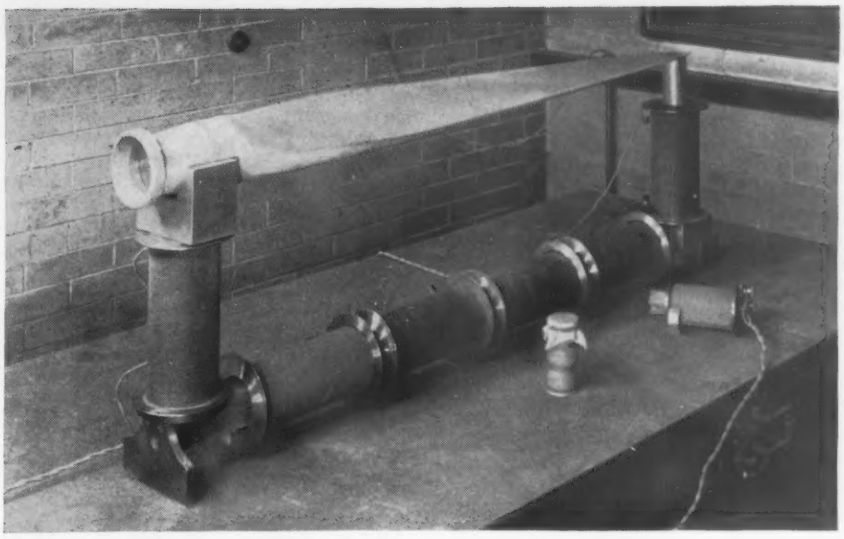


Fig. 1—Arrangement of magnetizing coils and pole pieces to apply electromagnetic test to full length of propeller blade

MANUFACTURE AND MAGNETIC TESTING OF HOLLOW STEEL PROPELLERS

HOLLOW steel airplane propellers have been in process of development over a period of about four years. Under governmental supervision, experimental tests have been performed on two general types—a tubular design pioneered by the Hamilton Standard Propeller Co., and a welded type produced under Dicks patents by the Pittsburgh Screw & Bolt Corp., Pittsburgh. General discussion of these two designs was published in STEEL, Nov. 27, 1930. Manufacture and testing of the latter type will be summarized in this discussion.

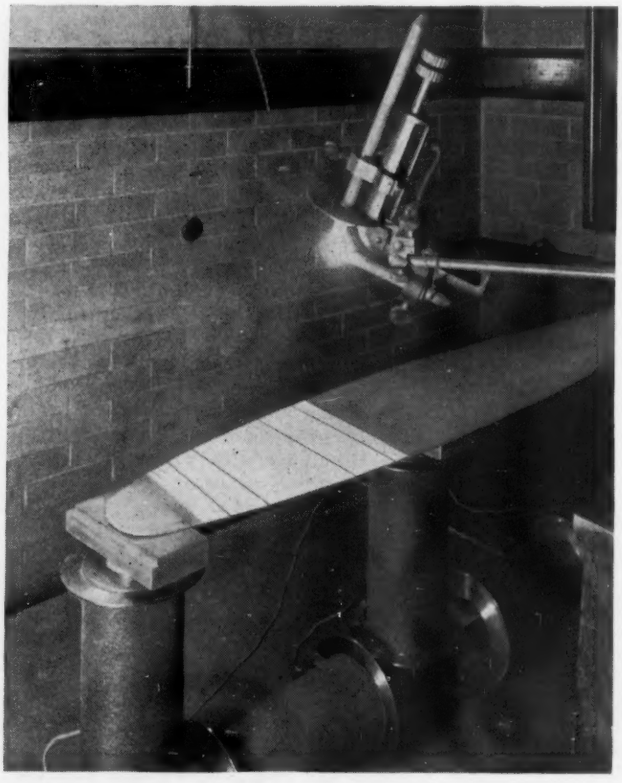


Fig. 2—Arrangement of apparatus to apply electromagnetic test to part of blade. The white band is blueprint paper upon which patterns of the iron powder are being recorded by the arc light

Chrome-vanadium steel conforming to S.A.E. 6130 specifications and produced in the electric furnace, is the only material used. Mill practice calls for special care in the elimination of about 40 per cent of the ingot top and in chipping for seams. Ingots are rolled into rectangular, flat plates. These then are cross rolled and a test sample taken from each plate is etched and examined for defects by means of photomicrographs. The plates, in two sizes, are made to close mill tolerances and are delivered with data identifying each plate with all mill work done upon it.

Although the Dicks-type blade is made principally of two pieces of steel—cambered face or "back," and thrust face—and has two weld seams along the length of the blade, only one seam is carried into the shank or root of the blade. The material forming the shank is an integral and original part of that forming the cambered face, the former being rolled into a more or less complete cylinder and welded together with a single seam. The second piece, which forms the thrust face, is confined to the blade proper and does not extend into the shank or root.

Another feature is that this second piece does

not extend entirely either to the leading edge or to the trailing edge, but falls short of both edges, thereby drawing the weld seams in and upon the thrust face, as shown in the sketch in Fig. 3. Thus, both the leading and trailing edges are formed by the same piece of steel that forms the back face and the shank of the blade. While tests indicate that this does not entirely relieve the welds from shearing stresses resulting from longitudinal bending of the blade, it does assure that the virgin metal of the back of the blade will cross the plane of shear in which the weld lies, resulting in the reinforcement of the weld seam against shearing stresses which on occasions have been the cause of failure of hollow steel propellers with welded-edge blades.

Plates Are Taper Milled

In the manufacture of the blades, there are some 55 different operations. The first major step is the milling of the steel plates. Upon a milling table the rectangular, flat plates are given a taper appropriate for the blade of which they are to form a part. This opportunity to taper-mill the plates make it possible to have the metal of the blades so placed that there will be a uniformity of stress throughout the blade, and also gives to the propeller designer a method by which he may change the period vibration of any particular blade design within considerable limits. While the taper varies, the average tapered plates have a difference in thickness from about ⅜ inch to approximately 1/16 inch.

After tapering, a cutting die punches out from the larger plate a section having the shape and dimensions that can subsequently be pressed by forming dies so that the greater part of this metal has the shape of the cambered side of a blade. The rest of this punched out piece of metal forms the shank of the blade. A smaller cutting die punches out from one of the smaller size tapered plates, a section having the shape and dimensions of the flat or thrust face of a completed blade. Dies press this metal to the form it would have as the flat or the thrust face of a completed blade. These forming dies are used with a hydraulic press of 1400 tons capacity.

Welding of these two sections is one of the important major operations in the manufacture of the blades. Both have, and must retain, the curvature of one of the sides or faces of a scientifically designed propeller. When welded together these stampings must form a structure that will be hollow to within ½ inch of the tip of the blade. Under these conditions, the stampings must be welded together so that both the weld and the metal adjacent thereto will have the strength to withstand all the stresses and strains of a high-speed propeller blade.

THAT steel must take second place to any other metal in the manufacture of airplane propellers is ably disproved in the accompanying article, abstracted from a paper presented by Hamilton Foley, Pittsburgh Screw & Bolt Corp., Pittsburgh, at the International Automotive Engineering congress of the Society of Automotive Engineers, held in Chicago, Aug. 28-Sept. 4. Rigid control of steel quality, care in fabricating and welding, and the development of an ingenious electromagnetic method of testing for defects, all under direct government supervision, have won acceptance of the hollow steel propeller for use on all types of commercial and passenger aircraft.

All welding is done by the atomic hydrogen method. Special fixtures, the result of more than a year of experimentation, hold the two sections. The welded product is immediately electric furnace heated to 1700 degrees Fahr. to remove all welding strains. The hub or shank end of the blade is then forged and the blade rough finished.

Heat treating is the major operation following. In electric furnaces equipped with recording pyrometers the welded blades are heated to 1650 degrees Fahr. and quenched in oil. This quench required long study and specially designed equipment, before a technique was found with which the blade could be brought through straight and without impairment of the pitch. Immediately upon withdrawal from quench the blade is passed to a second electric furnace where it is held for three hours for draw at a temperature of 1000 to 1100 degrees Fahr.

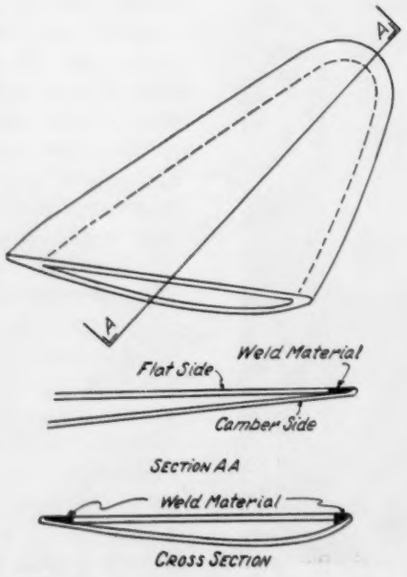


Fig. 3—Sketch showing how steel of camber side or back face of blade is formed to include both leading and trailing edges

This heat treatment produces the following physical properties: Elastic limit, 125,000 to 130,000 pounds per square inch; ultimate strength, 138,000 to 145,000 pounds per square inch; elongation 18 to 20 per cent; reduction of area, 57 to 62 per cent. With proportional limit well over 100,000 pounds per square inch and the average working stress not over 30,000 pounds per square inch, resistance to fatigue is high.

From the heat treating state the blades are passed through several finishing operations. When completed, the shank end of the blade has been finish ground to fit the standard type two-piece steel hub in general use, or with a special shank to fit the controllable-pitch hub.

Tested for Balance

These hollow steel blades are designed so that center of gravity of all sections falls upon the straight line passing through the axis of the blade. The hollow construction makes it possible by the application of metal within the blades to correct the vertical and horizontal balance within close limits. A master blade is used for horizontal balance. Vertical balance is obtained by the use of a special cylindrical tube-shaped tool. All parts of this tool being concentric with the axis of the tube, the center of gravity passes through the center line of the hub.

The blades can be adjusted for a vertical balance through a range of 180 degrees by the use of a special method for applying metal to the interior of the blade. Once the accurate balance of these blades has been adjusted at the propeller plant, flight service does not change it because the hardness of the steel makes erosion of metal negligible.

Hollow steel blades are especially appropriate and useful for controllable-pitch propellers with any design of hub or control mechanism. In these propellers the success of practically every design depends upon the simplicity with which the blades may be attached to and moved within the hub socket. The shank or hub end of the hollow steel blades may be forged and finish ground to almost any shape or size appropriate and necessary for use with controllable-pitch hubs. The saving in weight for controllable-pitch propellers using hollow steel blades is great, because of the proportionately small diameter of the blade root or shank necessary for a steel blade to withstand the centrifugal loads and the operation stresses.

Because of the importance of being able to detect flaws on the interior surface of the blades, engi-

neers of the Pittsburgh Screw and Bolt Corp. and the engineers of the metallurgical and the propeller sections of the army air corps at Wright Field, Dayton, O., and the bureau of standards, over a year ago undertook to study the possibilities of the magaflux or electromagnetic test method. They were concerned to know whether the test method would make it possible to detect conditions that might be dangerous before and after final heat treatment and whether it would be possible to detect flaws in the blades before purchase.

Each of these groups of engineers approached and studied the problem in its own way. Each line of study helped and confirmed the results obtained by the others. The air corps and the bureau of standards used the magnaflux and X-ray tests. The government engineers checked the magnaflux indications if possible with X-ray and where they considered it appropriate, they deep etched and made metallurgical examinations of particular sections.

Blades Cut Open by Saw

The Pittsburgh Screw and Bolt Corp. engineers used the magnaflux method and checked it with a fast, sharp saw. As soon as the electromagnetic test indicated an undesirable condition, that blade was cut open so that the inner structure could be examined. Hundreds of examinations, saw cuts, radiographs and metallurgical examinations have made it possible to reduce the conditions indicated by the magnaflux to a code for understanding and interpretation.

The electromagnetic theory of testing is based upon the fact that finely divided iron dust will cling to the edges of magnetized cracks. Maj. W. E. Hoke of the army initiated and obtained a patent for the iron-powder method of depicting the nature of magnetic fields to discover hidden defects in ferromagnetic materials. A patent was granted to Maj. Hoke in 1922.

His original method consisted of applying the finely divided iron particles to the surface of the magnetized piece under test while the iron particles were held in suspension in light oil. In a later development, carried out by A. V. deForest and others, the dry powder is sprinkled on the surface of the piece under test. DeForest developed a special "magnaflux powder" for this purpose, and hence the name now commonly is applied to the method.

The magnetic method of examination of a propeller blade involves placing the blade on the apparatus to be described later, so that the blade will be a part of a magnetic circuit of sufficient strength to cause the direction of the lines of magnetic flux passing through the blade to be shown clearly when the iron powder is sprinkled on the surface. The blade surface is carefully examined while it is in the field of the magnets to detect any concentration or piling up of the powder which would indicate a discontinuity in the steel. It is desirable to examine the blade under inspection with both longitudinal and transverse magnetization. Cracks and other linear defects show up most distinctly when they are at right angles to the direct of magnetization and may not be indicated at all if they are in line with the magnetic flux.

Sharp, well defined lines of powder or concentrated tufts of powder indicate defects. In general, the more intense the magnetization the easier the interpretation of the results. At the lower stages of magnetization, especially just below the point of maximum permeability, small amounts of mechanical strain affect the magnetic properties materially. This may account for the greater distinctness of the patterns of the powder obtained near the tip of the blade where the metal is relatively thin.

This test with the iron powder, when properly conducted, detects and outlines all well-defined defects of any consequence, which might be considered dangerous due to a reduction in strength or as a starting point for a fatigue failure in flight service.

Apparatus constructed at the bureau of standards for the application of the test has proved to be satisfactory in operation and the method has been applied to all the steel blades thus far received at the bureau. This apparatus, shown in Fig. 1, was designed primarily with a view to flexibility so that tests could be made under various experimental conditions.

Fig. 1 shows the apparatus set up to test a whole blade. The core and poles are of solid rolled machinery steel. The main core is 2 inches square and 53 inches long. The upright pole at one end is bolted to the core. The other pole can be placed at any desired position along the main core. Contact with the blade is made by means of adjustable pole pieces which fit over the ends of the poles.

The six magnetizing coils are wound on brass forms 9 inches long. By using different numbers of coils with appropriate connections, the magnetic circuit can be made of any desired length. Each coil has approximately 1500 turns of wire. Maximum current is 5 amperes, thus making a total available number of ampere-turns of 45,000. The resistance of each coil is such that three in series can be connected directly to a 110-volt direct-current line. If fewer coils are used a rheostat is placed in series to control current.

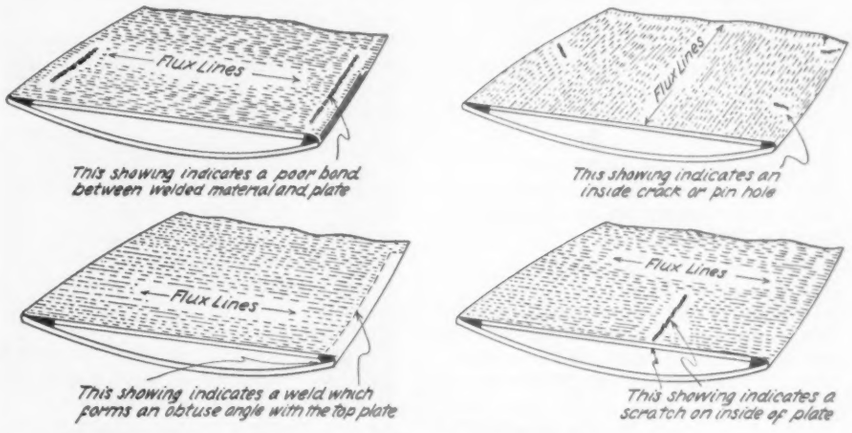

Flux Lines
This showing indicates a poor bond between welded material and plate
Flux Lines
This showing indicates an inside crack or pin hole
Flux Lines
This showing indicates a weld which forms an obtuse angle with the top plate
Flux Lines
This showing indicates a scratch on inside of plate

Fig. 4—Sketches showing four internal conditions which are revealed by the powder patterns obtained in the magnaflux tests on hollow steel propeller blades

If shorter lengths of a blade are to be examined or a transverse test is to be made, the apparatus is shortened up as shown in Fig. 2. This illustration also shows the method of making permanent records by means of blueprint paper. The paper is placed on the blade and exposed to light from an arc light after the powder has been applied. The pattern thus obtained lacks somewhat of the definition and detail obtained by sprinkling the powder directly on the steel but it has been found that the blueprint records are useful.

It has been found that the characteristics of the powder used are of considerable importance. There are three grades of powder regularly supplied by the A. V. deForest Associates, New York: A black powder; a white powder made by coating the black material; and a finer black powder intended for use in oil suspension. Of these, the latter gave the best results with the bureau of standards apparatus, especially when only that portion is used which will pass through a 270 mesh sieve.

The bureau of standards, after its

study for the greater part of a year to determine the extent to which the magnaflux method may be relied upon to reveal the presence of hidden defects in hollow steel propellers, formulated four conclusions, in the following words:

"In the light of the results of the present investigation the following conclusions appear to be justified:

"1. The magnaflux method, properly applied, will unfailingly reveal any serious defect in a blade.

"2. The magnaflux method gives indications of any irregularity in the material and it is not always possible to differentiate between serious defects and variations which may not impair the quality to a sufficient degree to make the blade unsafe for service.

"3. It seems probable that with further study, the technique might be developed to such an extent that more definite interpretations could be made.

"4. It is highly desirable that such further development should be attempted, since no other nondestructive method so far investigated or proposed appears to be satisfactory for the purpose."

Interpret Powder Patterns

The propeller officers of the army air corps have formulated a code for the interpretation of the magnaflux markings on a blade under examination. This code has been adopted, at least for the present, by the navy department, the department of commerce and the Pittsburgh Screw and Bolt Corp. The code lists eight influences or indications of discontinuity of material, any one of which, in either flat or cambered face of a hollow steel blade, would be cause for rejection of the blade.

This code applies also to all blades intended for commercial service. The inspector from the department of commerce is present when every Dicks-type hollow steel blade, intended for commercial service, is magnaflux tested, and unless this inspector is satisfied the blade is free from any of the powder markings that would indicate discontinuity or flaw in the weld or the steel in that blade, it cannot be approved.

When any blade is magnafluxed, a certificate of inspection is made out. This certificate shows that the blade has been examined under government specifications and found free from any of the eight conditions that would cause its rejection. A copy of this certificate goes to the department of commerce at Washington and another copy goes to the purchaser of that blade.

Four Internal Conditions

For the success of the magnaflux test, the bureau of standards found there can be no substitute for actual experience in the application of the method and the interpretation of the results, but time has greatly simplified an understanding of the method. Some time ago inspectors had to understand the magnaflux powder indications of some ten or twelve conditions that might appear in a completed blade. Today, the methods of manufacture have been so advanced and standardized that when a completed blade is under final examination, there are only four interior conditions which the powder may indicate.

These four conditions, sketched in Fig. 4, are:

1. Where there is a poor bond between the welded material and one of the plates of which the blade is made.

2. Where the weld material forms an obtuse angle with reference to the interior surface of the plate.

3. Where there is a crack or a pinhole on the inside of one of the plates of which the blade is made.

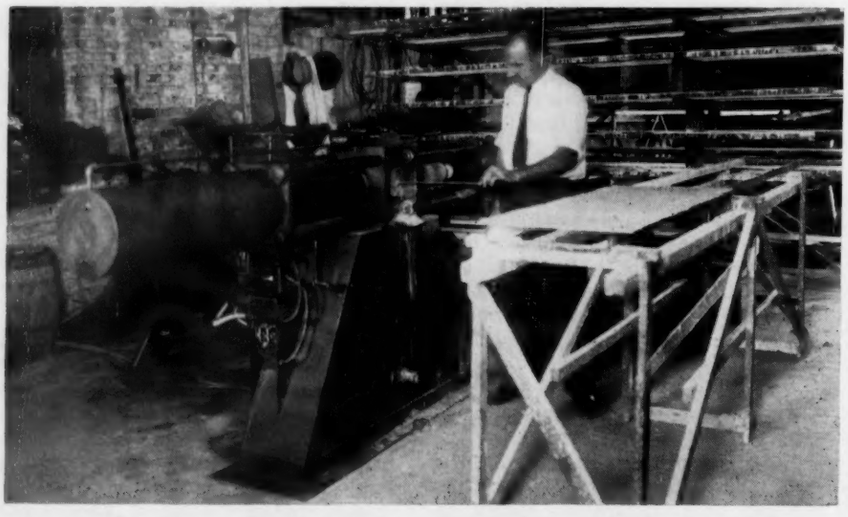
4. Where there is a flaw such as a scratch on the inside of one of the plates.

Two Govern Rejection

These four conditions and the magnaflux patterns for them are reported here, merely to give a clear and definite idea of what should be looked for with this method of inspection. Of the four interior conditions and the patterns for them here cited, only two would be sufficient to take a blade on which they appeared from flight service. No blade showing the "poor bond" or the "inside crack" condition would leave the propeller plant. These two patterns are easy to recognize and definite in what they tell of interior conditions. A blade on which either of these patterns appears should not be allowed to remain in flight.

The magnaflux method makes it possible to know, always, within a few minutes, whether flight service has caused a weakening of the weld or steel within the blade, invisible to the eye and not always detected by X-ray or etching.

The "obtuse angle" and the "inside scratch" patterns should be understood. The conditions they indicate may not be important for the strength of the blade. A mere scratch on the inside of one of the plates by a tool during manufacture will cause the pattern shown at the lower right of Fig. 4. Unless understood, this pattern might lead the inexperienced eye to distrust the blade on which it appeared.



APPLIES FLUX COATING TO WELDING RODS: This new 2 cylinder extruding machine, operating on the hydraulic principle, is continuous and automatic. Straightened and cut rods are loaded into a hopper from which they feed into the extruding chamber where they are given a concentric flux covering. While one rod is being coated, another is being loaded. As the electrodes are ejected—at a rate of one every 3 seconds—an operator places them on a rack for air drying prior to oven baking. The machine is a development of the Electric Arc Cutting & Welding Co., Newark, N. J.

Screw Thread Report Revised

Progress in commercial screw thread practice, based extensively on the standards established by the National Screw Thread commission, has been such as to require revisions and some additions to the standards promulgated in the commission's 1928 report. These changes are embodied in miscellaneous publication No. 141 of the department of commerce, Washington, titled *Report of the National Screw Thread Commission* and approved as of April 10, 1933. Copies of the 172-page report may be obtained from the superintendent of documents, Washington, for 15 cents each.

The Plastic Forming Of Metals

By PROFESSOR DR.-ING. ERICH SIEBEL
Translated by JOHN H. HITCHCOCK

Part II

Forces and Flow of Material in Technical Forming Processes

1. Compression and Stretching

IN THE compression of a prismatic body between plane and parallel plates, the relations appear to be particularly simple. The compression force acts in the direction of the axis of the body; no forces possible can be exerted on the lateral faces of the body. In the center portion of a body, which is high in comparison to its width, an approximately uni-axial stress condition therefore exists. In the vicinity of the end surfaces, this stress condition is distorted by the frictional forces which act along the press plates.

In the elastic condition, the shear stresses at the edges between the lateral faces and the end surfaces reach maximum values, because of the discontinuity of the force field which is applied here. At these points, then, the first permanent deformations occur as the compression force is increased. These deformations produce flow lines which are inclined at about 45 degrees to the axis of the body. Fig. 22 shows flow lines of this character in iron bodies, longitudinal sections of which have been etched according to Fry[42]. As shown by the flow lines, a conical-shaped part of the body at first remains undeformed.

Causes Surfaces to Bulge

In more severe deformations, the restriction of flow of material along the press plates causes a bulging in the vicinity of the upper and lower surfaces of contact, if the body is high, or causes a barrel-shaped bulging of the entire lateral face, when the height of the compressed body does not greatly exceed its width. The friction-cone theory, so-called because of the cone-shaped portions adjacent to the press plates which do not participate even in more severe deformations, has been

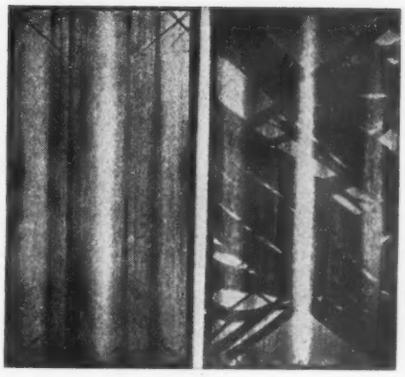


Fig. 22—Flow lines at beginning of compression tests (according to Meyer and Nehl)

advanced by F. Riedel[43] to explain this phenomenon. In spite of the support provided for this theory by the flow phenomena previously described, and by the phenomena of fracture in compression tests on brittle bodies, the theory is probably not tenable without qualifications.

In the compression of iron bodies provided with copper inserts, as Fig. 23 shows, restricted bow of material occurs in the press plate zones (I), which exhibit a gradual transition to the zones of principal deformation (II), so that the compression increases steadily from the press plate up to the middle of the body. The lateral zones (III) undergo a comparatively uniform compression over the entire height. In the branches of zone II, which extend into the edges of the body, one may conclude that high shear stresses also occur here, under the influence of which the parts of the lateral faces adjacent to the press plates, in more severe compression, are brought into contact with the press plates.

The influence of the friction on the press plates, as already described, can be analyzed numerically by the assumption that the frictional forces are distributed uniformly over the entire height of the compressed body. This assumption is the more justifiable, the less the height of the compressed body is in comparison to the transverse dimensions. Particularly for shallow compressed bodies, however, the determination of the resistance to flow arouses interest. If the frictional force on each unit of contact area is equated to $\mu \times k_f$, the approximate calculation becomes simple. According to Fig. 24, and assuming plane flow of material, the flow resistance p_{fl} which opposes the outward flow of the displaced material, at a distance x from a free lateral surface, is given by the relation:

$$p_{fl} = \int_0^{\frac{1}{2}x} 2\mu \times k_f \times \frac{dx}{h} = 2\mu \times k_f \times \frac{x}{h} \quad \ldots\ldots\ldots\

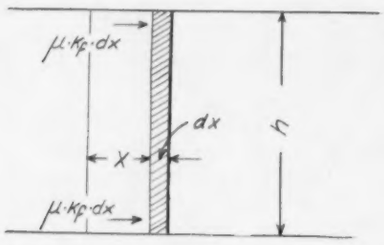


Fig. 24—Calculation of resistance to flow

body. A similar explanation was given by L. Prandtl[9] for the movement of a plastic mass between parallel plates.

Apparently equation (27) is valid also for the condition of rotational symmetry, or in other words, for the compression of a cylinder. If the further assumption is made that the normal compressive stress, p_1, acting on the press plates exceeds the flow resistance by the magnitude of the deformation strength, as indicated in equation (27) and if p_{r1} and p_1 accordingly are considered as principal stresses, then the effective compressive stress on the press plates, at a distance x from the enveloping surface, is given by the relation:

$$p_1 = k_f + p_{r1} = k_f \left(1 + 2\mu \times \frac{x}{h}\right) \quad \ldots\ldots(28).$$

The compression force for a cylinder of radius r and height h is then calculated as:

$$P = \int_0^r 2\pi(r - x)\,dx \times p_1 = k_f \times F \left(1 + \frac{2}{3}\mu \times \frac{r}{h}\right) \quad \ldots\ldots(29).$$

The compression force based upon these assumptions accordingly exceeds by the magnitude

$$F \times k_f \times \frac{2}{3}\mu \times \frac{r}{h}$$

the compression force for ideal compression; and the deformation resistance, if the internal forming loss is neglected, is calculated as:

$$K_f = \frac{P}{F} = k_f \left(1 + \frac{2}{3}\mu \times \frac{r}{h}\right) \quad \ldots\ldots(30).$$

The equation shows that the deformation resistance during compression, even with soft material, can reach a high value when the height of the body in question is small in comparison to its transverse dimensions. This circumstance is of particular technical significance in the use of soft materials, such as lead and others, as cushions for the equalization of pressure.

Inasmuch as the material flows in the direction of least resistance, and because, as a first approximation, the resistance to flow in the direction normal to compression between parallel plates is proportional to the distance from a free surface, the flow of material always is determined by the free surface which lies nearest. If the compressed body is bounded by two free surfaces, as shown in Fig. 25, then a plane, which bisects the angle α included by the free surfaces, forms the "flow-divide" or neutral plane for the flow of material toward one or the other free surface[4]. In the compression of a rectangular parallelopiped, neutral planes accordingly will exist first as shown by the solid lines in Fig. 26a.

If this region of flow, as indicated by broken lines, is separated into

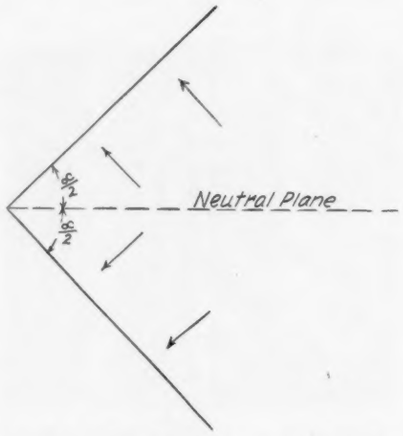


Fig. 25—Formation of a neutral plane

narrow strips or ribs which are normal to the bounding surfaces, and the deformations of which can be calculated by use of the condition of constant volume (equation 2), the peripheral outline after a small deformation is obtained in the form shown by the outside dotted line. If the described divisions are now chosen as shown in Fig. 26b, the flow of material for a small compression again can be followed, and finally, the shape of cross section for any degree of compression can be determined. The construction shows that a body of rectangular cross section must approach the circular form more and more in the course of compression. The shape thus determined corresponds the more closely to reality, the greater flow resistance occurs, and accordingly, the greater the coefficient of friction and the smaller the height of the body in question is in comparison to its transverse dimensions.

A higher resistance to flow in certain directions is desired in many forming processes. In drop forging, for instance, the resistance to flow in the flash must become so great at the end of the forming operation that the pressure in the die will be sufficient to guarantee the complete filling out of all cavities. Relatively small flash dimensions suffice to produce this resistance. A check calculation according to equation (27) shows that a flash 0.787-inch wide and 0.118-inch thick, with a friction coefficient of $\mu = 0.3$, produces a resistance to flow of

$$2 \times 0.3 \times k_f \times \frac{0.787}{0.118}$$

$= 4\ k_f$; and that accordingly, the pressure in the die in this case already amounts to four times the deformation strength of the material.

Press Plates Are Lubricated

In many cases, however, it is desired to make the resistance to flow normal to the direction of compression as small as possible. A reduction of the resistance to flow readily can be obtained by lubrication of the press plates, which decreases the coefficient of friction. Another means is to use inclined press plates, so that the enclosed space becomes wider in the direction of flow. In the latter case, a component of the pressure exerted by the press plates opposes the frictional forces, and it can offset the effect of the latter more or less. A technical application of this process is found at once in cone-compression tests, in which the influence of friction is eliminated by a cone-shaped form of the press plates. A further example of use is provided by the forging of wheel blanks. The forging die is formed with outwardly inclined working surfaces, as shown in Fig. 27, so that the displaced material can flow out easily in the radial direction. In spite of the large area of contact, it seems possible only in this way to carry out forging without excessive compressive forces.

In lengthening by forging, as shown in Fig. 28, forming occurs as a series of successive compressive

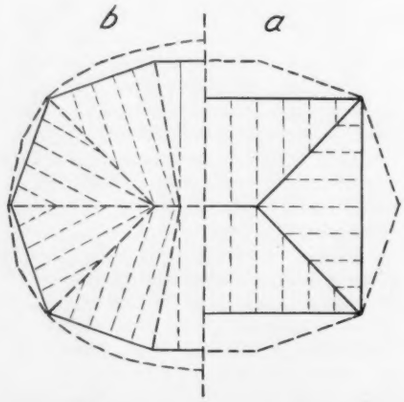


Fig. 26—Flow of material in compression of a rectangular parallelopiped

[4] H. Preussler: Zur Frage der bildsamen Formnaderung; Ber. Walzw.-Aussch. V. d. Eisenh. No. 36; St. u. E. 45(1925)p.1423.

operations. Compression is brought about by means of press plates which are applied perpendicularly to the axis of the bar as the latter is fed forward. The relations in this case are much more complicated than in simple compression, because the effect of the cohesion of the material, in the sections not participating in the forming, comes into consideration, in addition to the frictional effects on the press plates. The influence of these circumstances upon the stress relations is discussed in detail in Part III. The compressive forces can be calculated approximately by equation (25), in which values of the effective deformation resistance similar to those found in rolling must prevail.

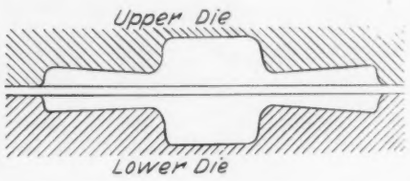


Fig. 27—Forging die for wheel blanks

Importance of Die and Feed

The flow of material in this process appears to be vastly influenced by the choice of die and of feed. If narrow, well-rounded dies are used, the resistance to flow in the longitudinal direction of the bar is small, and the displacement of material therefore has the effect primarily of stretching; whereas wide dies and a greater feed promote the flow of the displaced material in the lateral direction. Lengthening by forging, and to a still greater extent, shape-forging, are poorly suited to numerical treatment because the forming process is discontinuous. However, it appears possible to apply the energy equation (24), if each reduction under the hammer or the press is treated separately.

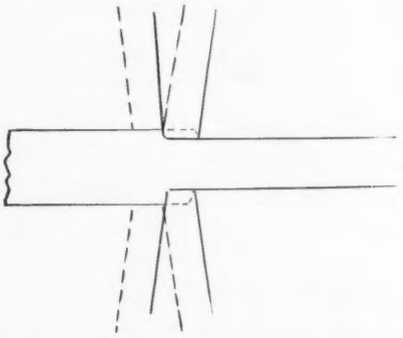


Fig. 28—Diagrammatic representation of lengthening by forging

(To be continued)

Welding Machine Operators Protected By Glass Shields and Ventilators

A SIMPLE but effective arrangement for protecting the operators of spot welding machines is employed by the Hubbard Spool Co., Chicago. The setup, shown in the accompanying illustration, consists of a glass shield and ventilating device, the former guarding the face of the operator from sparks and the latter sucking away gases which result from the welding operation. This protection was designed by the company and has proved an aid in increasing the efficiency of the worker.

Gases Developed Headaches

In the manufacture of spools, parts that are welded are stamped from oil steel sheets and the flash from the electrodes produces gases that formerly were breathed by the operators, resulting in headaches. The interior of the ventilating section after a relatively short period of operation acquires a carbon coating not unlike that accumulated in an automobile engine and illustrates the amount of solid matter given off with the gases.

The shield is constructed of two small channel side sections and a solid bottom piece, permitting the glass to be changed easily when its transparency is impaired. A bracket fastens the frame to the welding machine. The shield is adjustable and provides protection to the entire face as well as to the eyes. The ventilator also is adjustable. Frequently an apron is hung from the shield to guard the worker's body from sparks, but at the same time does not interfere with his vision or manipulation of parts being welded.

THE glass shield on this spot welding machine guards the operator's face from sparks and the ventilating device sucks away the gases. Both the shield and ventilator are adjustable

Rustproofing Liquid Can Be Applied to Rusted Metal

A new, liquid rustproofing compound has been introduced by the Stonhard Co., 401 North Broad street, Philadelphia, claimed to embody entirely new rust-arresting and rust-preventing principles. The liquid can be applied by brush or spray over new or already rusted metal surfaces. When applied to a rusted surface, the action of the liquid is said to weld the inert surface mass to the base metal and stop the further progress of the rust action by forming a nonporous moisture-proof coating.

The manufacturer states that the original treatment can be made into a finish coat by a single application, while aluminum powder, powdered graphite or dry red lead may be mixed with the liquid and applied to rusted surfaces for dual effect.

Applied to new metal surfaces, the material is claimed to prevent rust and, being transparent, does not cover up markings or identification signs.

LARGE USES OF STEEL IN SMALL WAYS

252nd Article ◆ Linemen's Climbers

A PREVIOUS article of this series (STEEL, April 18, 1932) referred to the large tonnage of steel consumed annually in the manufacture of pole line hardware. While of smaller proportions, considerable steel also is required for the making of various products employed in connection with the installation of this hardware, as well as in the erection and maintenance of communication and electric power lines. These products include such tools as pliers, hammers, wrenches, skinning knives and other linemen's equipment, such as safety belts and climbers.

Linemen's climbers have been used for many years in working on wood poles, essentially comprising a pair of spurs affixed to shanks which are strapped to the legs. The spurs provide a footing when driven into the pole, enabling the operator to climb easily without the aid of pole steps or to maintain a position on the pole while working.

While steel has replaced wood for poles to a large extent in the more densely populated districts for the installation of power, communication and street car trolley wire lines, the expansion in number of telephone and telegraph lines throughout the United States has helped to maintain the market for climbers since poles used in cross-country service and in rural areas invariably are of the wooden variety.

Chiefly of Spring Steel

A typical pair of linemen's climbers weighs about 3⅝ pounds and is made principally of spring steel, this material being used to manufacture the leg iron or shank. The spur, or gaff, is forged from special tool steel, hot riveted into the leg iron and cold calked. The gaff is hardened and drawn to the correct temper and the point then is filed to shape. Before inserting the spur the leg iron is hammered hot to an L-shape in order to fit under the foot, with the longer section varying in length from 15 to 18 inches.

Strap loops are punched from the shank at each end to hold the straps which secure the climbers to the wearer. A hole is punched at the bend of the shank, which is moderately thicker than the end sections, to receive the spur. Since the greatest amount of wear in the use of climbers occurs on the spurs the design described permits their removal after subsequent sharpenings have reduced their length to the extent of interfering with their efficient use. There are instances of several renewals of spurs before it has become necessary to discard the shanks. A protective surface is given the climbers after their fabrication, a coating of adherent asphaltum finish frequently being applied.

Photo Courtesy M. Klein & Sons, Chicago

Linemen working on wood poles use steel climbers, weighing 3⅝ pounds per pair

Specifications for Bridge, Building Steel Approved

Three specifications covering steel for bridges, steel for buildings, and mild steel plates have been approved for publication as tentative by the American Society for Testing Materials, Philadelphia, on recommendation of committee A-1 on steel of the society.

The new specifications for bridge and for building steel call for the 60,000 to 72,000 pounds per square inch tensile strength grade of steel, previously required in the tentative specifications for medium structural steel, issued by the society in 1932, but which are now withdrawn.

The new specifications for steel for bridges and buildings follow in general the requirements given in the medium structural steel specifications issued last year, while the specifications for mild steel plates supply a grade of steel comparable to the existing standard structural grade.

However, a number of changes have been made in the new specifications. The data for bridge and building steel provide special requirements for rolled base plates over 2 inches in thickness for bearing purposes. These must be open-hearth or electric-furnace steel, 0.20 to 0.35 per cent carbon. Physical tests are not required for this material. The new specificattions also exempt from tension tests flat-rolled steel 3/16 inch and under in thickness, shapes less than 1 square inch in cross section and bars, other than flats, less than ½ inch in thickness and diameter.

Treatment for Wood Screws Makes Driving Easier

A treatment for wood screws which greatly improves their driving properties has been developed by the Elco Tool & Screw Corp., 1800 Broadway, Rockford, Ill. This treatment, designated as "Speedizing" is obtained by a chemical process and was perfected as a result of considerable research.

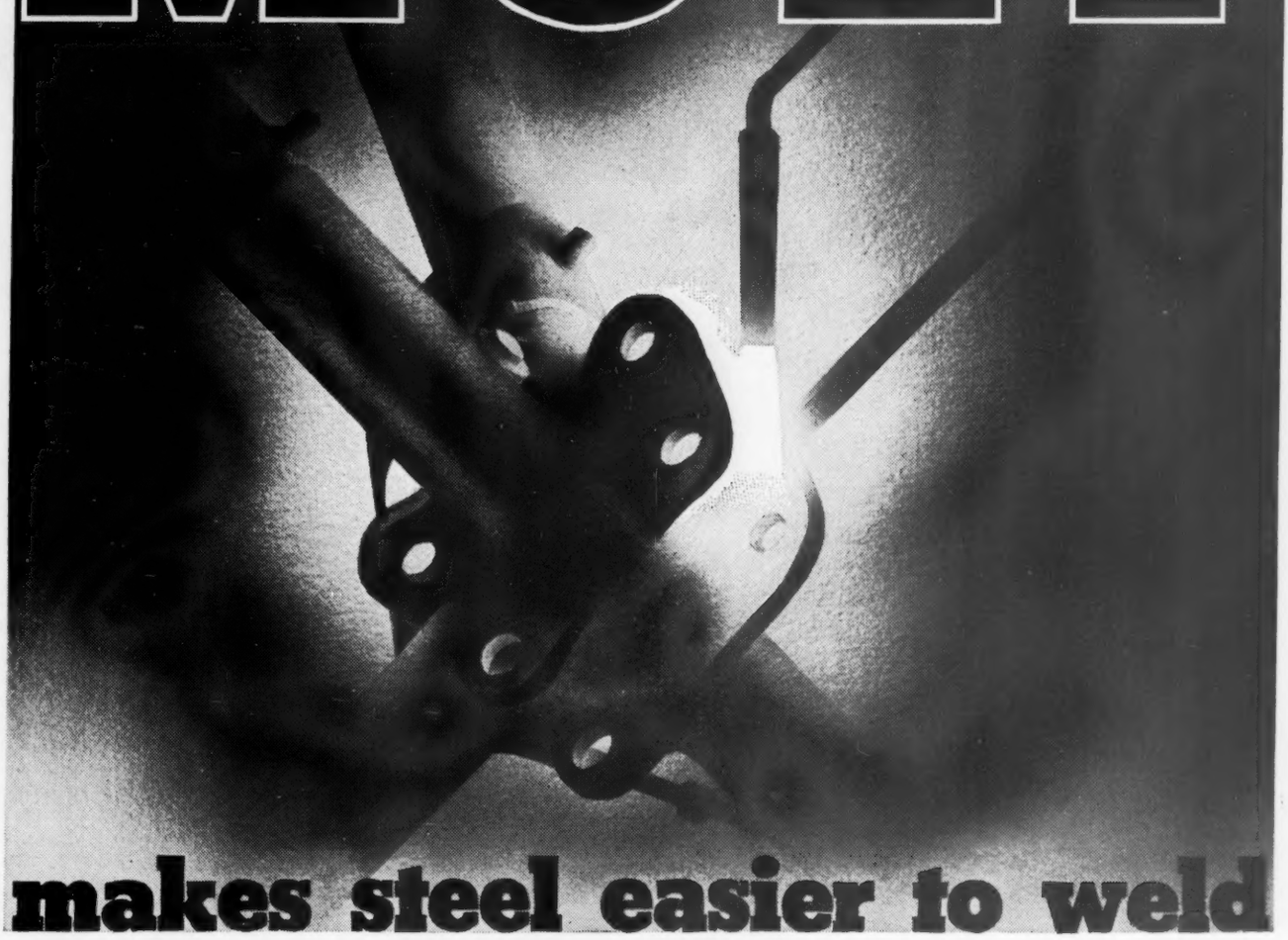
Tests have shown that in cases where untreated screws cannot be driven or only with considerable difficulty, the treated screws are driven with comparative ease. It is claimed that to drive a treated screw by a portable electric screw driver requires only about one-third the power necessary for a plain wood screw of equal size under identical conditions, this fact having been borne out by careful tests.

The manufacturer states that with the use of the treated screws, the need for resorting to soaping, waxing, greasing or otherwise lubricating screws before driving is made unnecessary. The treatment can be applied to any screw or metal product.

Developments in Electric Motor Field Surveyed

Louis Allis Co., Milwaukee, is publishing bimonthly a special 24-page magazine, *The Louis Allis Messenger*, devoted to new developments in the field of electric motors, as well as to the presentation of data on the care and operation of motors. The current issue, November-December, features an article on selection of the correct motor for the job, written by Harold L. Smith, chief engineer of the company. Anyone caring to receive the magazine regularly should address his request to the advertising department of the company.

MOLY



makes steel easier to weld

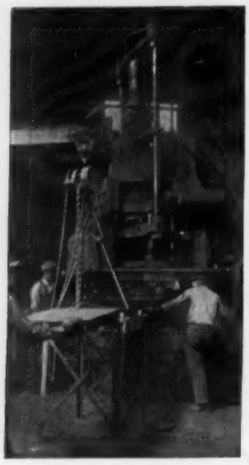
MOLYBDENUM is practically the only alloy used in steel which does not interfere with welding. In airplane construction, where strength and light weight are of paramount importance, welding and Moly steels have gone hand in hand. The welds have proved tougher and stronger, with less embrittlement of surrounding areas. Indeed, Moly is often used in the coatings of welding rods to improve the quality of the weld.

In the well-known 18 and 8 stainless steel, now attracting the attention of engineers, Moly additions of about 2% to 4% are being used to increase desirable characteristics, particularly resistance to acid corrosion. It is interesting to note that a Molybdenized stainless steel does not require the usual surface polish to resist corrosion.

Moly always improves steel. Increases tensile strength, creep strength and resistance to wear. Gives a superior steel at a "competitive" initial price and a lower cost for the finished product. The modern Climax laboratories in Detroit and the Climax metallurgists are prepared to prove these points. Write for details about our free engineering and experimental services and an interesting new book: "Molybdenum." Climax Molybdenum Co., 295 Madison Avenue, New York City.

CLIMAX **Mo-lyb-den-um**

Making the Most of



METHODS AND MATERIALS

CENTRIFUGAL casting of all the high-chromium steels is a recent development promising great progress. This process makes possible the casting of large tubes from compositions which at present cannot be fabricated into seamless tubing. Tubes larger than those obtainable from high-chromium steels capable of being pierced have been made in this manner. Recently several tubes were cast successfully from a steel containing approximately 25 chromium, 12 nickel and 0.30 per cent carbon. These tubes had a diameter of 13 inches, a wall thickness of ⅝ inch and a length of 12 feet. They were installed in a chemical process operating at 1830 degrees Fahr.

$ $ $

The welding shop of a western copper mining company recently had a badly worn ball mill trunnion brought in for reconditioning. This trunnion was 20 inches diameter, 30 inches long, and weighed approximately 1½ tons. To replace it would have cost in the neighborhood of $300. Using an automatic arc welding head, the welders built the trunnion up to a diameter of 21 inches by deposition of 300 pounds of electrode, then machined it down to 20-inch diameter on a boring mill. Total cost of reconditioning the trunnion, including power, labor, electrodes and overhead, was approximately $75. Since repair, the mill has given excellent service.

$ $ $

THE materiel division of the army air corps uses an old punch press as a fatigue testing machine for airplane shock absorber springs. The equipment operates 24 hours a day and a small counter indicates the number of times the spring is compressed. Tests have been hampered by the fact that the spring might break in the night and the machine would continue to operate, recording an incorrect number of compressions on the counter. This problem was solved by installing a photoelectric relay in such a position that the light beam passes beneath the bottom of the plunger when the latter is in its lowest position. In this arrangement, the spring intercepts the light beam and prevents it from falling upon the phototube under ordinary circumstances. When the spring breaks, however, it collapses and the beam passes over it to the phototube which actuates a relay to stop the operation of the machine.

$ $ $

That motor-driven machine tools are now recognized as standard by most manufacturers is borne out by the fact that only three new machines shipped by one machine tool builder so far this year were ordered for belt drive. All three were plain internal grinders and two went overseas.

$ $ $

Workmen should be encouraged to keep their overalls and jackets clean and free from grease—this applies particularly to maintenance men who may have occasion to use open lights. A fashion indulged in some years back, and one which may return with lean years, is the burlap apron. This

makeshift usually is tied around the body with rope and sometimes wire. When it becomes oil soaked, all it needs is contact with heat or flame to make a good blaze which might cause fatal burns to the wearer. If aprons are necessary, a type which is oil proof and can be removed quickly should be obtained.

$ $ $

In chromium plating gages, thickness of plate should be determined by the requirements of the job, and in all cases should be kept down to a minimum. General practice on salvage and new gages is to grind the gage sufficiently undersize so as to leave from 0.0015 to 0.0025 inch thickness of plate after finishing. The undersize gage then is plated to a thickness of about 0.005 inch, which is sufficient for final grinding and lapping.

$ $ $

In the production of fine writing papers, stainless steel alloys have proved their value in the elimination of rust and corrosion products which might cause discoloration or impairment of quality and necessitate further processing for their removal.

$ $ $

IN AUGUST, 1925, a railroad shop placed an electric storage battery crane truck in service. Not only has this truck been used for the actual task of repairing and rebuilding locomotives in the shop, but it has been used also to transport to storage the many heavy items which must be kept on hand constantly. After more than eight years of service, the same battery is being used. It has not been out of commission for a single day and nothing has been expended for repairs. Depreciation of the battery has amounted to only $3.66 per month, a figure which is lowered with each additional month of operation.

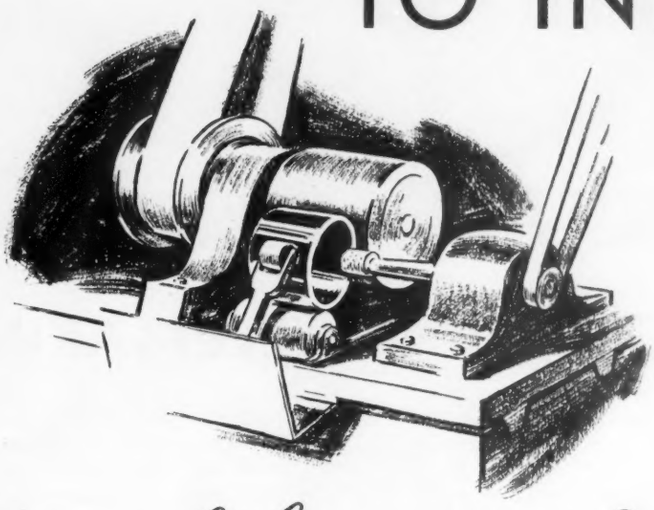
$ $ $

One of the large water pumps at an eastern coal mine went out of commission with a large cast-iron gear wheel broken. Because of water conditions, the entire mine would have been forced to shut down unless the pump could be put back in service quickly. An oxyacetylene bronze weld was made by servicemen and the pump resumed operation in 2 hours.

$ $ $

Additions of silicon, nickel, and chromium are claimed to confer high heat-resistant properties to two cast irons developed in Great Britain. One contains about 5 per cent silicon and 2.5 per cent total carbon. This iron is not suitable for castings subjected to rapid heating or cooling since it cracks easily. The second iron is an austenitic gray iron containing for most purposes about 2 per cent total carbon, 5 per cent silicon, 1 per cent manganese, 18 per cent nickel and 2 to 5 per cent chromium. This iron is extremely tough and ductile.

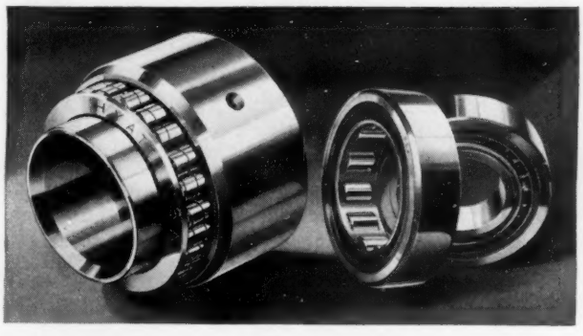
WE HAND A NEW TOOL TO INDUSTRY



Chuckless grinding

The problem of making races for bearings with wall variations held to an irreducible minimum, that is, with bores and outside diameters truly concentric, has intrigued engineers for years.

Hyatt determined to solve the problem and now with considerable pride and satisfaction we announce the new process which we have originated and nurtured through persistent effort—we call it chuckless grinding.



Soon, all other industries may benefit from this Hyatt research and experimentation which has taken years of effort and which to perfect, cost thousands of dollars in our plant and elsewhere.

But, the furthering of this revolutionary development of grinding accuracy in race manufacture, is only another measure of Hyatt endeavor to find better ways to safeguard quality. We thus hope to insure the continued faith of Hyatt customers. Hyatt Roller Bearing Company, Newark, Detroit, Chicago, Pittsburgh, Oakland.

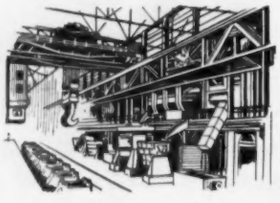
HYATT

ROLLER BEARINGS

PRODUCT OF GENERAL MOTORS

PROGRESS IN STEELMAKING

GIVING tin mill black plate a coating of turpentine, instead of the usual oiling, is a recent practice brought about by demands of certain branches of the lithographing trade which has found the turpentine coating superior to oil in preventing rust.



FOR pouring medium and large tonnage open-hearth heats, 6-inch ladle sleeves and 2-inch low-carbon steel rods are desirable.

♦ ♦ ♦

Cutting welding wire of various gages into different standard lengths at the rate of 300 pieces a minute (standard lengths) is afforded by a recently developed self-contained machine. On shorter lengths of wire for other purposes as high as 3600 pieces a minute can be produced. The unit also is equipped with an arrangement whereby the welding wire receives a coating at the same time it is cut to length.

♦ ♦ ♦

Electro depositing zinc on steel sheets automatically has been made possible by the development of a continuous machine in England. The unit includes a train of baths and vats. Sheets are fed in at one end and are advanced by rollers and guides into a pickling vat, then into a rinsing bath, thence into one or more zinc depositing baths. After being sprayed with water the sheets are fed through rubber rolls, which remove the excess water, and finally are dried by passing over heaters of the electrical resistant type. Sheets subjected to the foregoing treatment are claimed to possess a uniform matt and grey surface which is rustproof even at cut edges. No prime coat of paint is necessary when steel thus treated is used for automobile fender stock.

♦ ♦ ♦

Separation of 3½ per cent nickel steels from low-chromium grades now is being accomplished by means of spark testing. Cobalt high-speed steel also can be differentiated from tungsten steel of standard analysis by this method of testing as can steels of different nickel content.

♦ ♦ ♦

Nonmetallic material recently developed for radial parts of roll neck bearings on severe applications is claimed to withstand high thrust loads and pressures without dislamination, splitting or working out of the chuck.

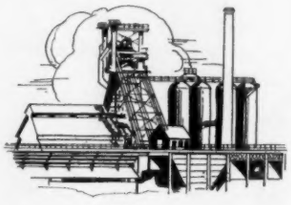
♦ ♦ ♦

Strip with a normalized grain structure and with a bright surface imparted by cold rolling has been made possible by the use of the controlled-atmosphere, electric-normalizing furnace.

RATE of solidification of steel is contingent upon the shape of the molds, whereas any shaking or vibration of the mold affects the texture of the solidified steel, according to experiments made abroad. Pure metallic tin was employed in making the observations.

♦ ♦ ♦

Single stand 4-high cold mills for rolling strip gradually are replacing mills of the 2-high type at many plants in this country. The 4-high unit effects an increase in the rolling speed, permits heavier drafts to be taken, affords uniformity of gage from edge to edge, reduces the number of anneals, and increases the output per turn from two to four times that obtained from mills of 2-high design.



STANDARD heavy rolled steel sections now form the bottom of a hot blast stove serving an Ohio stack, as a result of a new type bottom construction. Heavy angles welded on top of the columns serve as guides in which the girders rest and ride, free to expand lengthwise. Short length girders are installed to minimize the effects of expansion and possible warping. Short heavy bars welded together into grids rest free on the girders. The bars in each grid section and on which the checkers rest are spaced sufficiently far apart to allow for expansion of the brick. Each alternate bar on which the checkers rest is of sufficient height to lock each course of brick horizontally. The new type steel bottom obviates undue loads or strains on the base, provides free access to the flues and is adjustable to take care of any variation in the checkers.

♦ ♦ ♦

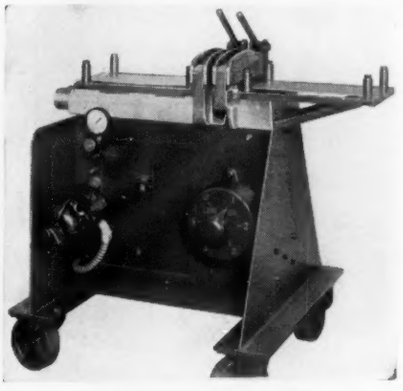
Improvement in bessemer screw stock has afforded production increases of practical applications ranging from 11 to 99 per cent. Less energy is required in cutting, machine time is reduced and the quality of finish improved.

NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

New Flash Welder Embodies Finger Tip Control

Micro Products Co., Peoria, Ill., has introduced a new automatic precision type flash welder with finger tip control, permitting variable flashing speed and upset pressure. The machine, shown herewith, can handle ¾-inch diameter round steel or approximately the same area on rectangular or flat stock, with a minimum width of ⅜-inch and a maximum width of 6 inches. Transformer capacity is 22 kilowatts. Size of the machine is 29½ x 28 x 29 inches. A special hydraulic unit can be adjusted readily for quick and accurate setting of valves that regulate the welding cycle. A mechanical interlock is provided between the hydraulic unit and the electric control, which is entirely automatic during the welding cycle. Welding headpieces are of special alloy bronze. The movable slide is actuated hydraulically on the upset stroke and returned to position by spring pressure. Operating clamps are supplied in several styles to accommodate various shapes.



Precision type flash welder manufactured by Micro Products Co.

◆

System Records Productive Welding Operation

Robt. E. Kinkead Inc., 3441 Lee road, Cleveland, recently developed a welding time recording system which indicates the number of hours and minutes an electric arc welding operator actually has his welding arc in productive operation. The purpose is accomplished by connecting electric clocks with jump figure dials through suitable relays to the welding circuit. Absolutely foolproof, the relays are adjusted so that the clocks run only while the operator is welding. If the electrode is shorted the clock connected in the circuit stops; if the arc is held long enough so that no productive welding is accomplished, the clock stops. Restarting is effected automatically when welding is resumed. The time clock shown herewith, is suitable for time study on single machines; however, larger units have been developed, which will handle batteries of welding machines.

Kinkead welding time recorder unit checks operators

◆

New Clutches Are Operated By Compressed Air

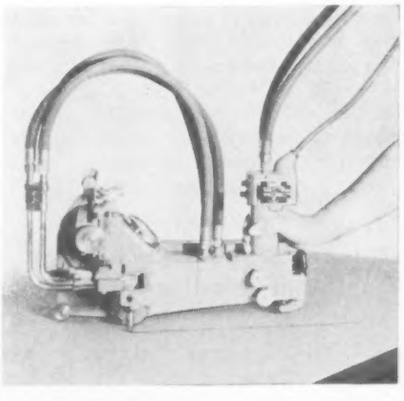
Ajax Mfg. Co., Euclid, O., recently brought out a line of quick-acting, pneumatically-operated clutches for use on forging machines, presses, bulldozers and similar equipment. The clutches, shown herewith, are of the usual multiple-disk friction type, excepting that pressure is applied to the friction surfaces by introducing compressed air behind an annular piston acting directly upon the plates. There are no toggles, wedges, thrust collars, yokes or levers employed to transmit this pressure as it is self-opposed within the housing of the plates. The only operating parts, aside from the piston and the plates, are compression springs for retracting the piston and disengaging the plates when the air pressure is released. At present these clutches are manufactured in sizes with friction plate diameters of 18, 21, 24 and 30 inches with normal capacities ranging from 100 to 1000 horsepower per 100 revolutions per minute. Larger and smaller sizes will be built on order.

Ajax pneumatically-operated multiple disk friction clutch

◆

Portability Is Feature of Gas Cutting Machine

Linde Air Products Co., 30 East Forty-second street, New York, is marketing a portable cutting machine which combines the "carry-about" features of a blowpipe with the accuracy and finish of a cutting machine. The blowpipe is mounted on an electrically-driven aircooled chassis equipped with a direct drive to run on either a 1½-inch angle-iron track or any relatively smooth plate. When operated on the track, the machine, shown herewith, does straight-line cutting automatically. For cutting simple shapes it can be guided with a hand grip. A center and radius rod are furnished for automatic circle cutting. The blowpipe can be adjusted vertically or hori-



Linde portable gas cutting machine known as the Oxweld Secator

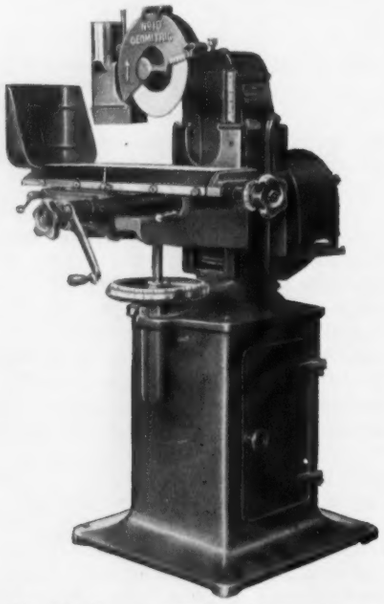
zontally, and also to cut bevels up to 45 degrees.

The company also is introducing a straightline cutting machine. This unit consists essentially of a steel channel supporting base, means for moving the blowpipe, and adjustments for setting the blowpipe to cut bevels.

◆

Introduces New Chaser Grinder And Universal Fixture

Geometric Tool Co., New Haven, Conn., recently developed a chaser grinder designated No. 10. The unit, shown in the accompanying illustration, with proper fixtures will sharpen any kind or make of die head or tap chaser, milled, tapped, circular or tangent, within its capacity. In addition, and because of its longitudinal transverse and vertical travel, it is adaptable for other tool grinding work. The machine is supplied either with or without the style E universal chaser grinding fixture. Fixture is mounted on the table of the grinder. Chaser holders, one for each size of chaser blank, are mounted on this fixture.

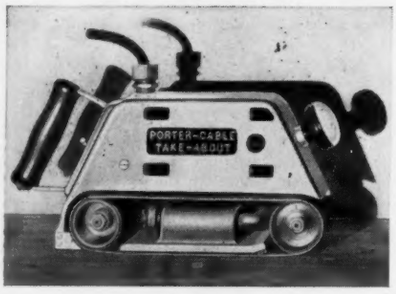


No. 10 chaser grinder developed recently by Geometric Tool Co.

◆

Balance Is Asset to New Hand Belt Sander

Porter-Cable Machine Co., Syracuse, N. Y., recently placed on the market an electric hand belt sander, shown herewith. Uses for this 3-inch balanced unit include polishing stainless steel tablets, safes, metal doors; sanding down filler, surfacing slate, in addition to finishing and refinishing tables, sash, doors, etc. A newly designed bench stand can be furnished for the sander.



Porter-Cable sander, grinder, polisher weighs only 15 pounds

◆

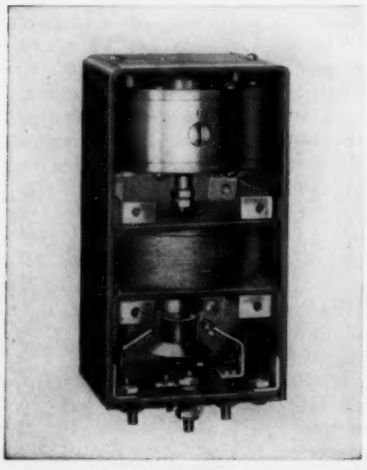
Furnace Observation Port Closes Automatically

Plibrico Jointless Firebrick Co., 1800 block on Kingsbury street, Chicago, recently introduced an observation port for observing furnace conditions. The port is provided with a divided cover which opens at a touch on the handle and closes automatically the moment the handle is releaesd by the operator. It is impossible for the operator to leave the port uncovered allowing an inrush of excess air.

◆

Relay Provides Accurate Time Control

American Gas Accumulator Co., Elizabeth, N. J., has designed for use in connection with any electrical device requiring a delay interval, the Agastat which is an instantaneously recycling unit that will give a delay ranging from a fraction of a second to several minutes. The time unit on this electrical time delay relay, shown herewith, is unaffected by temperature, dust or humidity changes.



Agastat relay meets a wide variety of applications

◆

Electric Contact Gages Fill Many Requirements

Hays Corp., Michigan City, Ind., has announced a complete line of compact electric contact gages for draft, pressure and differential draft or pressure in ranges between 1/10-inch water and 100 inches water. The units, shown herewith, employ the Hays dry-type actuating unit. These gages are offered for either high or low contact service or for both. They are adaptable to applications where it is desired to sound an alarm or light a bulls-eye when certain pressures reach a predetermined high or low point, as in drying, ventilating dust-collecting and similar systems. Used in conjunction with intermediate devices they may be employed to open and close dampers, start and stop fan or vibrator motors, etc.

Hays electric contact gage for draft, pressure and differential draft

Confidence Gaining as Steel Rate Moves Up

Rising Trend Continues, with Large Purchasing by Railroads and Automobile Industry Still To Come—Price Advances Acting as Spur—Exports Rise Sharply

WITH considerable underlying strength manifest in demand for iron and steel, and the steelworks operating rate continuing to rise moderately, the industry is hopeful that December will reverse the usual seasonal trend, and result in a larger volume of orders and specifications than the past month.

Gains in steel operations last week which lifted the national average half a point to 28½ per cent—in contrast with 17 per cent a year ago—were achieved without heavy purchasing by the railroads and automobile industry. They can be traced to the general desire of consumers to take in the bulk of the material due them on fourth quarter contracts.

Last week the first of the 1934 automobile models came off the assembly line, and though some makers are shutting down for inventories, steel releases as a whole are beginning to expand. Larger buying by the railroads and for public works is expected to be an early development. Confidence of the steel industry, therefore, is not now being diminishd by the customary year-end influences.

Sheets, Strip, Plates, Shapes and Bars Reaffirmed for First Quarter

Such price adjustments as have been made for the first quarter are calculated to induce specifying and new purchasing. The majority of heavy finished products are unchanged from present market levels, but as most consumers have contracts extending to Dec. 1 which were booked at lower prices, substantial specifications are assured. Also, in products that have just been increased for first quarter, purchasing is expected to be accelerated.

Tin plate prices have been advanced $12 a ton; terne plate $7; wire rods are up $1; manufacturers' wire $2; wire nails $5; track bolts $3; bale ties $7 to $13; boiler tubes $4 to $6.

All sheet and strip prices and plates, shapes and bars have been extended for first quarter. Due to the increase in wire, bolt manufacturers contemplate an adjustment. A rise of $3 a ton on cold-finished steel bars and $1 a ton on concrete reinforcing bars also is being considered.

With these exceptions, the steel price structure for the first quarter now is definitely known. The advances do not become effective until the first week in December, and they will apply on spot business next month.

The only other price changes announced during the week were increases of 50 cents to $1 a ton on pig iron in eastern markets, and $1 a ton on cast iron pipe at Chicago.

An amendment to the steel code permits quoting prices to the railroads for six months, instead of three. This need was brought out by the Pennsylvania's inquiry for 159,000 tons of rails and accessories, on which bids were opened last week and forwarded to Co-ordinator Eastman.

Standard Oil Buys 35,000,000 Cans; October Exports Quadruple Last Year's

Practically all the railroads have started negotiations for rails, fastenings and miscellaneous materials, many of them to buy with their own funds instead of borrowing from the government. This is the case with the Lackawanna, which came into the market for 12,000 tons of rails and 3600 tons of track fastenings.

Structural steel awards for the week dropped to 15,077 tons, including 7000 tons for Mississippi river locks. Pipemakers are looking forward to large requirements from Russia, but understand they will have to finance sales. Following the price determination on tin plate, Standard Oil of New Jersey ordered 35,000,000 cans.

November pig iron shipments were larger than those of October, and specifications indicate December will show further improvement. Little scrap is moving, and the market is easier.

Iron and steel exports for October rose sharply to 164,755 gross tons from 108,799 tons in September, and were four times the October tonnage last year. Imports, on the other hand, dropped to 46,673 tons from 55,706 tons in September.

Steelworks operations during the week increased 1 point to 22 per cent at Pittsburgh; 1 to 32 at Youngstown; 2 to 48 at Cleveland; 5 to 51 at Wheeling; and 5 to 75 in New England. The rate declined 9 points to 36 per cent at Detroit; and ½-point to 17 in eastern Pennsylvania. It remained unchanged at 32 per cent at Buffalo; 20 at Birmingham; and 29 at Chicago.

STEEL's iron and steel composite for the week remains $31.59; the finished steel composite, $49.20; while scrap is down 25 cents to $9.33.

COMPOSITE MARKET AVERAGES

	Nov. 25	Nov. 18	One Month Ago Oct., 1933	Three Months Ago Aug., 1933	One Year Ago Nov., 1932	Ten Years Ago Nov., 1923
Iron and Steel Composite	$31.59	$31.59	$31.59	$30.04	$29.12	$42.81
Finished Steel Composite	49.20	49.20	49.20	47.50	47.20	67.48
Steelworks Scrap Composite	9.33	9.58	10.37	11.57	6.87	14.05

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Nov. 25, 1933	Oct. 1933	Aug. 1933	Nov. 1932
Finished Material				
Steel bars, Pittsburgh	1.75	1.75	1.60	1.60
Steel bars, Chicago	1.80	1.80	1.70	1.70
Steel bars, Philadelphia	2.04	2.04	1.91	1.91
Iron bars, Chicago	1.60	1.60	1.65	1.65
Shapes, Pittsburgh	1.70	1.70	1.60	1.60
Shapes, Philadelphia	1.90	1.90½	1.81½	1.75
Shapes, Chicago	1.75	1.75	1.70	1.70
Tank plates, Pittsburgh	1.70	1.70	1.60	1.60
Tank plates, Philadelphia	1.88	1.88½	1.79½	1.69½
Tank plates, Chicago	1.75	1.75	1.70	1.70
Sheets, No. 10, blue anneal., Pitts.	1.75	1.75	1.65	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.25	2.10
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.85	2.85
Sheets, No. 10, blue anneal., Gary	1.85	1.85	1.75	1.80
Sheets, No. 24, hot ann., Gary	2.35	2.35	2.40	2.25
Sheets, No. 24, galvan., Gary	2.95	2.95	3.00	2.90
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	2.10	2.10	1.95
Tin plate, per base box, Pitts.	4.65	4.65	4.25	4.50
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	Nov. 25, 1933	Oct. 1933	Aug. 1933	Nov. 1932
Pig Iron				
Bessemer, del. Pittsburgh	19.26	19.26	18.26	15.76
Basic, valley	17.00	17.00	16.00	14.00
Basic, eastern, del. eastern Pa.	17.76	17.76	17.20	13.50
No. 2 foundry, del. Pittsburgh	18.76	18.76	17.76	15.76
No. 2 foundry, Chicago	17.50	17.50	17.00	15.50
Southern No. 2, Birmingham	13.50	13.50	13.00	11.00
No. 2X, Eastern, del. Phila.	18.63	18.63	17.88	13.95
Malleable, valley	17.50	17.50	16.50	14.50
Malleable, Chicago	17.50	17.50	17.00	15.50
Lake Superior charcoal, del. Chi.	23.54	23.54	23.04	23.04
Gray forge, del. Pittsburgh	18.38	18.38	17.13	15.63
Ferromanganese, del. Pittsburgh	87.24	87.24	87.24	73.24
Scrap				
Heavy melting steel, Pittsburgh	$11.50	12.45	13.75	9.15
Heavy melting steel, eastern Pa.	9.00	10.19	12.00	7.25
Heavy melting steel, Chicago	8.25	9.35	10.40	5.60
No. 1 wrought, eastern Pa.	9.50	10.75	13.00	7.25
No. 1 wrought, Chicago	8.10	9.10	10.35	5.60
Rails for rolling, Chicago	10.25	11.10	11.25	8.25
Coke				
Connellsville, furnace, ovens	3.75	3.25	2.75	1.80
Connellsville, foundry, ovens	4.25	3.85	3.10	2.65

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.75c
Gary, base	1.85c
Chicago, del.	1.88½c
New York, del.	2.08c
Phila., del.	2.04c
Birm., base	1.90c
St. Louis, del.	2.07c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.90c
Gary, base	2.00c
Chicago, del.	2.03½c
Phila., del.	2.19c
New York, del.	2.23c
St. Louis, del.	1.97c
Birm., base	2.05c
F.o.b. cars, dock Pacific ports	2.42½c

HOT ROLLED ANN. No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.38½c
Detroit, delivered	2.45c
New York, del.	2.58c
Phila., del.	2.54c
Birm., base	2.40c
St. Louis, del.	2.57c
F.o.b. cars, dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.98½c
Phila., del.	3.14c
New York, del.	3.18c
Birm., base	3.00c
St. Louis, del.	3.17c
San Fran., f.o.b. cars, dock	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.82c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Detroit, delivered	2.50c
Gary, base	2.40c
Philadelphia, del.	2.59c
New York, del.	2.63c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Detroit, delivered	1.90c
Gary, base	2.85c
Philadelphia, del.	3.04c
New York, del.	3.08c

ENAMELING SHEETS

Pitts., No. 10	2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

(advanced Dec. 1)
Per 100-lb. box, Pittsburgh
Gary base, 10 cents higher.

Tin plate, coke base, contract	$4.65
Do., stock	4.05
Long ternes, No. 24 unassorted	2.90c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel: sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot Strip	17c	18.5c	21c	26c
Cold Strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.70c
New York, del.	1.98c
Phila., del.	1.88½c
Boston, del.	2.10c
Buffalo, del.	1.93½c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Birm., base	1.85c
Coatesville, base	1.80c
Sparrows Pt., base	1.80c
Pac. Coast, f.o.b. St. Louis, del.	1.97c
cars, dock	2.25c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.90½c
New York, del.	1.95½c
Boston, del.	2.08½c
Bethlehem, base	1.80c
Chicago, base	1.75c
Cleveland, del.	1.88½c
Buffalo, base	1.80c
Birm., base	1.85c
Pac. Coast, f.o.b. cars, dock	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.75c
Chicago, base	1.80c
Birm., base	1.90c
Buffalo, base	1.85c
Cleveland, base	1.80c
Detroit, delivered	1.90c
Pac. Coast ports, cars, dock, c.i.f.	2.30c
Philadelphia, del.	2.04c
Boston, del.	2.19c
New York, del.	2.08c
Pitts., forg. qual.	1.75c-2.25c

RAIL STEEL
To Manufacturing Trade

Pittsburgh	1.65c
Chicago	1.70c
Cleveland	1.70c
Gary, Ind.	1.70c
Buffalo	1.75c

IRON

Chicago, base	1.60c
Philadelphia, base	1.74c
Pitts., refined	2.75c-7.50c

REINFORCING
New billet, mill lengths, carlots

Pittsburgh	1.80c
Chicago, Gary, Buffalo, Cleve., Birm., Young	1.85c
Gulf ports	2.20c
Pacific coast ports	2.35c
Philadelphia, del.	2.09c

Rail steel

Pittsburgh, base	1.75c
Chicago, Buffalo, Cleveland, Birm., Young	1.80c
Gulf ports	2.15c
Pacific coast ports	2.30c

Wire Products □ □

(Advance effective Dec. 4)

(Prices on carloads. Mixed carloads up 10c; joint carloads up 20c; less carloads up 30c. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland
(Per 100-lb. keg)

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized fence wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00
Plain wire, 6-9 gage to mfg. trade	2.10c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.10c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Carbon Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Chicago, Cleveland, Buffalo up 5c; Detroit up 20c; eastern Michigan up 25c.

Shafting □ □ □

Turned and ground, Pitts. base	
1⅛-inch	3.25c
1 7/16 to 1½-inch	2.75c
1 9/16 to 1⅞-inch	2.60c
1 11/16 to 2⅞-inch	2.45c
2 1/16 to 6-inch	2.30c

Alloy Steel Bars □

Hot rolled

Pittsburgh, Buffalo, Chicago, Massillon	2.45c
Bethlehem	2.55c

Alloy		Alloy	
S.A.E.	Diff.	S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 carbon base plus extras	

Strip and Hoops □

Hot strip to 23⅛-in. Pitts.	1.75c
Do., Chicago	1.85c
Do., del. Detroit	1.95c
Do., del. Phila.	2.04c
Do., del. N. Y.	2.08c
Cooperage hoop, Pittsburgh	1.85c
Do., Chicago	1.95c
Cold-rolled strip, Pitts., Cleve.	2.40c
Worcester	2.60c

Rails, Track Material □

(Gross Ton)

Stand. rails, mill	$36.37½
Relay rails, Pitts.	
20-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$18.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light rails, billet qual., Pitts., Chi.	$32.00
Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R., base	2.40c
*Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs. up $1; 12 lbs., up $2; 8 and 10 lbs. up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons or more; diff. for less.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	70 off
Rolled thread, ½ x 6 and smaller	70 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	70 off
Tire bolts	60 off
Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller,	70 off
Step bolts	66 off
Elevator bolts	66 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Rivets, Wrought Washers

Struc., c.l., Pitts. Cleve.	2.75c
Struc., c.l., Chi.	2.85c
7/16-in. & smaller, Pitts., Chi., Cleve.	70 and 10 off
Wrought washers, Pitts., Chi., Phila.	6.00-6.25 off

Cut Nails, Piling □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pitts.	2.00c
Steel piling, Chi., Buff.	2.10c

Pipe and Tubing

(Tubing advanced Dec. 1)

Base $200 net ton, except on standard comercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Gary, Ind., Lorain, O., to consumers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD
Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD
Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

LINE PIPE
Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½

Iron

⅛—1½ inch, black and galv.	take 4 pts. over;
2½—6 inch	2 pts. over discounts for same sizes, standard pipe list.
8—12 inch	no extra.

BOILER TUBES
C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above discounts subject to preferential of two 5% discounts on steel and 10% on charcoal iron.

Lapwelded steel: Under 10,000 lbs., 6 pts. under base and one 5%; on 10,000 lbs. to carload, 4 pts. under base and two 5%. Quantity discounts same as for hot-rolled. Charcoal iron: Under 10,000 lbs., 2 pts. under base; on 10,000 lbs. to carload, base and one 5%.

SEAMLESS BOILER TUBES
Cold Drawn

2—2¼	27	3¼—3½	44
2½—2¾	34	4	46
3	41	4½, 5, 6	46

(On 1—1¾-inch sizes mechanical tubing dis. apply.)
Hot Rolled

2—2¼	33	3¼—3½	50
2½—2¾	40	4	52
3	47	4½, 5, 6	42

Quantity discounts: Under 10,000 lbs., 10 pts. and 5%; 10,000 to 24,999 lbs., 6 pts. and 5%; 25,000 lbs. to carload, 2 pts. and 5 and 5%; carload and over, base discount and 5 and 5%. No extra for lengths 24 ft. and under.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

*6-in. & over, Birm.	$36.00-37.00
*4-in., Birm.	39.00-40.00
*4-in., Chicago	47.00-48.00
*6 to 24-in., Chicago	44.00-45.00
6-in. & over, east fdy.	40.00
Do., 4-in.	43.00

Class A pipe $3 over Class B. Stand. fitgs., Birm, base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Semifinished Steel □

Prices Per Gross Ton

BILLETS AND BLOOMS
4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.30
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS
(Advanced Dec. 1)

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts. and Chicago	1.60c

Coke □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$3.75
Connellsville fdry.	4.25
Connell. prem. fdry.	5.25
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi. ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	10.50
St. Louis, del.	8.75
Birmingham, ovens	5.00
Indianapolis, del.	8.75
Ashland, Ky., Connells., basis	5.50
Portsmouth, ovens, Connell. basis	5.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del	9.00

Coke By-Products □

Per gallon, producers' plants, Tank lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per lb., f.o.b. New York

Phenol (200 lb. drums)	0.163c
Do., (100 lb.)	0.173c

Per lb., producers' plants

Naphthalene flakes and balls	6.00- 7.25
Per 100 lb., Atlantic seaboard	
Sulphate of ammonia	$1.20

Pig Iron

Delivered prices do not include switching charges except as noted. No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25

Gross Tons

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$17.50	$18.00	$17.00	$18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
From Swedeland, Pa., del. to Phila.	18.26	18.76	17.76	.....
From Bethlehem, del. to Brooklyn..	19.77	20.27	.....	.....
From Bethlehem, del. to Newark, N. J.	18.99	19.39	.....	.....
Basing Point:				
Everett, Mass	18.00	18.50	17.50	19.00
From Everett, del. to Boston	18.50	19.00	18.00	19.50
Basing Point:				
Buffalo	17.50	18.00	16.50	18.50
From Buffalo, del. to Boston	18.50	19.00	18.00	19.50
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh district	(Neville Island base, plus 63c to $1.13 switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O...	19.26	19.26	18.76	19.76
Basing Point:				
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee..	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	(Granite City base, plus 50-cent switching charge)			
Basing Point:				
Birmingham, Ala.	13.50	.....	12.50	.....
From Birmingham del. to:				
Boston	18.12	.....	17.62	.....
Newark, N. J.	18.51	.....	.....	.....
Brooklyn, N. Y.	19.39	.....	.....	.....
Baltimore	18.02	.....	17.52	.....
Cleveland	19.64	.....	18.64	.....
Cincinnati	18.23	.....	17.11	.....
Chicago	18.16	.....	19.14	.....
St. Louis	17.62	.....	17.50	.....
Basing Point:				
Provo, Utah	16.50	.....	.....	.....

(Everett, Mass., price up 50c, other eastern prices up $1, on Dec. 1)

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$22.00. Basing point: Johnson City, Tenn.—.....

Philadelphia, standard and copper bearing..... 23.13

GRAY FORGE		CHARCOAL	
Valley furnace	17.25	Lake Superior fur.	20.50
Pitts. dist. fur.	17.75	Do., del. Chicago	23.54

SILVERY

Jackson County, O., base: 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base: 10%—27.25; 11—$28.75; 12—$30.25; 13—31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	8.00- 9.00
Cop-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50
No. Afr. low phos.	7.00
Swedish basic, 65%	8.00
Swedish low phos.	8.50
Spanish, No. Afr. basic, 50 to 60%.	7.00
Tungsten, spot, sh. ton unit, duty pd.	$14.00-14.25
N. F. fdy., 55%.	7.00
Chrome ore, 48% gross ton c.i.f.	$17.00-18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasion, 52-55%	22.00
So. African, 52%.	21.00-22.00
So. Afr., 49-51%.	20.00-21.00
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet E. Chicago	54.00
Birmingham, Ala.	55.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 and 5 per cent grade

Washed gravel, duty paid, tide, gross ton	$20.00
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$15.00

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†	27.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload.	82.50
Do, 75 per cent	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrodhrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb. cont.	1.16- 1.25
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton., frt., all., lb.	7.00
Do, under 1 ton	7.50
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb., except as specified. Copper, brass products based on 9.00c, Conn., copper

Sheets

Yellow brass (high)	14.75
Copper, hot rolled	17.12½
Lead, cut, to jobbers	8.00
Zinc, 100-lb. base	9.00

Tubes and Pipes

High yellow brass.	16.37½
Seamless copper	16.62½

Rods

High yellow brass.	12.25
Copper	13.87½

Anodes

Copper, untrimmed	14.50

Wire

Yellow brass (high)	14.75

Old Metals

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	4.37½-4.87½
Chicago	4.25- 4.50
*Cleveland	4.50- 5.00
St. Louis	3.50- 3.75

Heavy Copper and Wire

New York	6.25- 6.37½
Chicago, No. 1	5.75- 6.00
Cleveland	5.00- 5.50
St. Louis	5.25

Composition Brass Borings

New York	4.12½-4.37½

Light Copper

New York	5.25- 5.50
Chicago	4.50-4.87½
Cleveland	4.50- 5.00
St. Louis	4.25

Light Brass

*Chicago	2.62½-2.87½
Cleveland	2.50- 3.00

Lead

New York	3.25- 3.37½
Cleveland	3.00- 3.25
Chicago	3.00- 3.25
St. Louis	2.50- 2.75

Zinc

New York	2.25- 2.50
Cleveland	2.25- 2.50
Chicago	2.00- 2.25
St. Louis	2.25- 2.50

Aluminum

*Clips, soft, Cleve.	11.50-12.50
*Borings, Cleve.	5.00- 5.50
*Mixed, cast, Cleve.	7.50- 7.75
Mixed, cast, St. L.	7.00- 7.50

Secondary Metals

*Brass ingot, 85-5-5-5	8.50
Remelt Al., No. 12.	12.00-12.50

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dealers	5.00- 5.25
Buffalo, No. 1	9.25-10.00
Buffalo, No. 2	8.00- 8.50
Chicago	8.00- 8.50
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	7.00- 7.50
Detroit, No. 2	6.25- 6.75
Eastern Pa.	9.00
Eastern Pa., No. 2	7.50- 8.00
Federal, Ill.	7.25- 7.75
Granite City, Ill.	7.25- 7.75
N. Y., deal. R. R.	7.50
N. Y., deal. No. 2	6.50
Pittsburgh, No. 1	11.25-11.75
St. L., No. 1 del.	8.00- 8.50
Valleys, No. 1	11.50-12.00

COMPRESSED SHEETS

Buffalo, dealers	8.00- 8.50
Chicago, factory	7.00- 7.50
Cleveland	8.25- 8.75
Detroit	7.00- 7.50
E. Pa., new mat.	8.50- 9.00
Pittsburgh	11.00-11.50
Valleys	11.00-11.50

BUNDLED SHEETS

Buffalo	5.50- 6.00
Cincinnati, del.	5.50- 6.00
Cleveland	6.25- 6.75
Pittsburgh	10.00-10.50
St. Louis	5.00- 5.50

SHEET CLIPPINGS LOOSE

Chicago	4.00- 4.50
Cincinnati	4.50- 5.00
Detroit	5.00- 5.50
St. Louis	4.50- 5.00

STEEL RAILS, SHORT

Birmingham	10.00-11.00
Boston, dealers	5.00- 5.25
Buffalo	12.00-12.50
Chicago (3 ft.)	10.00-10.50
Chicago (2 ft.)	10.50-11.00
Cincinnati, del.	11.00-11.50
Detroit	8.50- 9.00
Pitts., (open-hearth, 3 ft. and less)	13.50-14.00
St. Louis	10.50-11.00

STOVE PLATE

Birmingham	10.00-11.00
Boston, dealers	4.50- 4.75
Buffalo	8.50- 9.00
Chicago, net	6.00- 6.50
Cincinnati, dealers	6.00- 6.50
Detroit, net	4.50- 5.00
Eastern Pa.	7.50
N. Y., deal., fdry.	5.00- 5.50
St. Louis	6.50- 7.00

COUPLERS, SPRINGS

Buffalo	11.50-12.00
Chicago	9.00- 9.50
Eastern Pa.	13.00-13.50
Pittsburgh	13.50-14.00
St. Louis	9.00- 9.50

ANGLE BARS—STEEL

Chicago	9.00- 9.50
St. Louis	8.75- 9.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50-12.50
Cleveland bil. and bloom crops	12.50-13.50
Eastern Pa. crops	14.00-14.50
Pittsburgh billet bloom crops	13.50-14.00
Pittsburgh, sheet bar crops	13.50-14.00

FROGS, SWITCHES

Chicago	8.50- 9.00
St. Louis	9.00- 9.50

SHOVELING STEEL

Chicago	8.00- 8.50
St. Louis	8.00- 8.50

RAILROAD WROUGHT

Birmingham	7.00- 8.00
Boston, dealers	2.00- 2.50
Buffalo, No. 1	7.00- 8.00
Buffalo, No. 2	9.50-10.00
Chicago, No. 1, net	7.00- 7.50
Chicago, No. 2	8.00- 8.50
Cincinnati, No. 2	8.00- 8.50
Eastern Pa.	9.50
N. Y., No. 1 deal.	7.00- 7.50
Pittsburgh, No. 1	11.25-11.75
St. Louis, No. 1	6.00- 6.50
St. Louis, No. 2	8.00- 8.50

SPECIFICATION PIPE

Boston	4.00- 4.50
Eastern Pa.	9.50
New York, dealers	4.75- 5.25

BUSHELING

Buffalo, No. 1	8.00- 8.50
Chicago, No. 1	7.00- 7.50
Cinci., No. 1 deal.	5.75- 6.25
Cincinnati, No. 2	2.50- 3.00
Cleveland, No. 2	7.00- 7.25
Detroit, No. 1 new	6.25- 6.75
St. Louis, No. 1	4.50- 5.00
Valleys, new No. 1	10.50-11.00

MACHINE TURNINGS

Birmingham	3.50- 4.50
Boston, dealers	2.00
Buffalo	6.25- 6.50
Chicago	5.00- 5.50
Cinci., dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
Eastern Pa.	6.50
New York, dealers	2.50- 3.00
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50
Valleys	7.00- 7.50

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	2.00
Buffalo	6.25- 6.50
Cincinnati, dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	6.00- 6.50
Eastern Pa.	5.00- 5.50
New York, dealers	2.00- 2.50
Pittsburgh	7.50- 8.00

CAST IRON BORINGS

Birming., plain	3.50- 4.50
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.25- 6.50
Chicago	5.00- 5.50
Cincinnati, dealers	4.50- 5.00
Cleveland	7.00- 7.50
Detroit	6.00- 6.50
E. Pa., chemical	12.00-15.00
New York, dealers	3.00
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50

PIPE AND FLUES

Cincinnati, dealers	4.00- 4.50

RAILROAD GRATE BARS

Buffalo	5.00- 5.50
Chicago, net	6.00- 6.50
Cincinnati	4.75- 5.25
Eastern Pa.	8.00
New York, dealers	4.25- 4.50
St. Louis	5.50- 6.00

FORGE FLASHINGS

Boston, dealers	3.75- 4.00
Buffalo	8.00- 8.50
Cleve., over 10-in.	8.50- 9.00
Detroit	5.50- 6.00

FORGE SCRAP

Boston, dealers	3.75- 4.00
Chicago, heavy	9.50-10.00
Eastern Pa.	10.00-10.50

ARCH BARS, TRANSOMS

Chicago, net	6.50- 7.00
St. Louis	9.00- 9.50

AXLE TURNINGS

Boston, dealers	3.50- 3.75
Buffalo	7.50- 8.00
Chicago, elec. fur.	7.00- 7.50
Cleveland	9.00- 9.50
Eastern Pa.	9.00- 9.50
St. Louis	5.00- 5.25

STEEL CAR AXLES

Birmingham	9.00-10.50
Boston, ship. point.	8.00- 8.50
Buffalo	10.00-11.00
Chicago, net	10.00-10.50
Eastern Pa.	15.00
St. Louis	11.00-11.50

SHAFTING

Boston, ship. point.	8.25- 8.50
Eastern Pa.	14.00
New York, dealers	9.50-10.00
St. Louis	7.50- 8.00

CAR WHEELS

Birmingham, iron	7.00- 8.00
Boston, iron deal.	6.00- 6.50
Buffalo, iron	8.00- 9.00
Buffalo, steel	10.50-11.00
Chicago, iron	9.00- 9.50
Chi., rolled steel	9.50-10.00
Cincinnati, iron	8.00- 8.50
E. Pa., iron	11.50-12.00
E. Pa., steel	13.00-13.50
Pittsburgh, iron	10.50-11.00
Pittsburgh, steel	13.50-14.00
St. Louis, iron	6.50- 7.00
St. Louis, steel	9.50-10.00

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 2	5.00- 5.50
Boston, Tex. con.	10.25-10.50
Buffalo, cupola	9.50-10.00
Buffalo, mach.	10.00-10.50
Chicago, agri. net	7.00- 7.50
Chi., mach. net	7.75- 8.25
Chi., railroad net	7.25- 7.75
Cinci., mach. cup	8.00- 8.50
Cleveland, cupola	8.50- 9.00
Detroit, net	7.00 7.50
E. Pa., cupola	11.50-12.00
N. Y., cup. deal.	6.00- 6.50
N. Y., del. local foundries	9.00- 9.50
Pittsburgh, cupola	11.00-11.50
San Fran., del.	13.50-14.00
Seattle	4.50- 6.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	5.00- 5.50
Buffalo, break	7.00- 7.50
Cleveland, break	6.75- 7.00
Detroit, break	5.00- 5.50
Detroit, auto net	7.50- 8.00
Eastern Pa.	10.00
N. Y., No. 1, deal.	6.50- 7.00
N. Y., break. deal.	5.50- 6.00
Pittsburgh	10.00-10.50

MALLEABLE

Boston, consum.	12.00-12.25
Buffalo	10.00-11.00
Chicago, R. R.	8.50- 9.00
Cinci., agri. del.	8.00- 8.50
Cinci., R. R. del.	8.50- 9.00
Cleveland, rail	11.00-11.50
Detroit, auto	6.50- 7.00
St. Louis, R. R.	8.00- 8.50
Eastern Pa., R. R.	12.50-13.00

RAILS FOR ROLLING
5 feet and over

Birmingham	9.00-10.00
Boston, dealers	7.00- 7.25
Buffalo	9.00- 9.50
Chicago	10.00-10.50
Eastern Pa.	12.50
New York, dealer	6.50- 7.00
St. Louis	9.25- 9.75

LOCOMOTIVE TIRES

Chicago (cut)	9.50-10.00
St. L., No. 1	8.00- 8.50

LOW PHOS. PUNCHINGS

Buffalo	11.00-11.50
Chicago	10.00-10.50
Eastern Pa.	12.50-13.50
Pittsburgh	13.50-14.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper: Electro., del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin New York: Spot	Straits Tin New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Nickel Ingot
Nov. 18	8.25	8.37½	8.00	54.25	54.70	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 20	8.25	8.37½	8.00	54.75	55.30	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 21	8.25	8.37½	8.00	55.50	56.05	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 22	8.25	8.37½	8.00	55.65	56.15	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 23	8.25	8.37½	8.00	54.00	54.50	4.30	4.15	4.50	*22.90	7.25	35.00
Nov. 24	8.25	8.37½	8.00	53.00	53.50	4.30	4.15	4.50	*22.90	7.25	35.00

*Nominal quotation. Market range 19.90c to 22.90c

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	2.60c
Boston††	2.90c
Buffalo	2.95c
Chattanooga..	3.05c
Chicago	2.90c
Cincinnati	3.10c
Cleveland	2.90c
Detroit	2.98½c
Houston	2.40c
Los Ang.	3.30c
New Orleans	3.00c
New York‡(d)	3.17c
Philadelphia*	2.60c
Pittsburgh	2.85c
Portland	3.40c
San Fran.	3.55c
Seattle	3.40c
St. Louis	3.14c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	□
Baltimore* ...	2.60c
Chattanooga..	3.05c
Chicago	2.75c
Cincinnati	3.10c
Detroit	2.98½c
New York‡(d)	3.10c
Philadelphia*	2.60c
St. Louis	3.14c
Tulsa	3.25c

REINFORC. BARS	□
Baltimore	2.35c-3.00c
Boston	2.75c-3.25c
Buffalo	1.95c
Chattanooga..	3.05c
Chicago	1.95c-2.10c
Cincinnati	3.10c
Cleveland	2.22½c
Houston	3.00c
Los Ang. cl....	3.00c
New Orleans	3.00c
New York	3.17c
Phila.	2.62½c
Pittsburgh	3.00c
S. Fran. f.o.b.	3.15c
Seattle	3.50c
St. Louis	3.29c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	□
Baltimore* ...	2.60c
Boston††	3.07c
Buffalo	3.20c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.21c
Detroit	3.30c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.27c
Philadelphia*	2.60c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.55c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

PLATES	□
Baltimore* ...	2.60c
Boston††	3.08c
Buffalo	3.20c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.30c
Cleveland, ¼ in. and thicker	3.21c
Cleve., 3/16-in	3.20c
Detroit	3.30c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles ..	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia*	2.60c
Phila. floor....	4.35c
Pittsburgh	3.05c
Portland	3.40c
San Fran.	3.50c
Seattle	3.40c
St. Louis	3.34c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	□
Baltimore* ...	2.75c
Boston††	2.90c
Buffalo	3.10c
Chattanooga..	3.50c
Chicago	2.95c
Cincinnati	3.10c
Cleveland	3.01c
Det., 8-10 ga.	3.03½c
Houston	3.35c
Los Ang.....	3.45c
New Orleans	3.50c
New York	3.17c
Portland	3.65c
Philadelphia*	2.75c
Pitts.	2.85c
San Fran.	3.75c
Seattle	3.65c
St. Louis	3.19c-3.36c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	□
Balt.*†	3.50c
Boston††	3.75c
Buffalo	3.25c
Chattanooga..	4.00c
Chicago	3.70c
Cincinnati	3.85c
Cleveland	3.76c
Detroit	3.78½c
Los Ang.	4.05c
New York	3.65c
Philadelphia*†	3.40c
Pitts.	3.35c
Portland	4.25c
San Fran.	4.25c
Seattle	4.25c
St. Louis	3.94c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	□
Balt.*†	3.75c
Buffalo	4.00c
Boston	4.60c
Chattanooga..	4.25c
Chicago	4.20c-4.30c
Cincinnati	4.45c
Cleveland	4.36c
Detroit	4.45c
Houston	3.57c
Los Ang.	4.65c
New Orleans	4.35c
New York	4.25c
Pitts.**	3.95c-4.20c
Portland	4.85c
San Fran.	4.85c
Seattle	4.85c
St. Louis	4.54c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.00c

BANDS	□
Baltimore	2.90c
Boston††	3.15c
Buffalo	3.30c
Chattanooga..	3.25c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Det. 3/16-in. & lighter ..	3.28½c
Houston	2.85c
Los Ang.	3.80c
New Orleans	3.20c
New York(d)	3.42c
Philadelphia...	2.90c
Pittsburgh	3.10c
Portland	3.90c
San Fran.	3.15c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.44c

HOOPS	□
Baltimore	2.80c
Boston	4.15c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.35c
Det. No. 14 & lighter ..	3.28½c
New York	3.42c
Philadelphia...	3.15c
Pittsburgh	3.75c
Seattle	5.40c
St. Paul	3.75c

COLD FIN. STEEL	□
Baltimore (c)	3.33c
Boston	3.83c-4.33c
Buffalo	3.25c
Chattanooga*	3.90c
Chicago	3.35c
Cincinnati	3.55c
Cleveland	3.25c
Detroit	3.40c
Los Ang.	5.85c
New Orleans ..	4.25c
New York	3.79c
Philadelphia..	3.58c
Pittsburgh	3.20c
Portland (f)..	4.75c
San Fran. (d)	5.85c
Seattle (f).....	4.75c
St. Paul	3.20c
St. Louis	3.44c
Tulsa	4.65c

COLD ROLL. STRIP	□
Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b) ..	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Philadelphia..	4.55c
New York	4.55c
St. Louis	5.74c

(a) Rounds, hex. only
(b) Net base straightening, cutting boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Nov. 23

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon.	$15.85	2 18 6	$7.91	1 12 6
Basic bessemer	14.63	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.08	16.26	3 0 0	....	.....
SEMIFINISHED STEEL				
Billets	$29.81	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	40.65	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$42.01	7 15 0	$26.77	5 10 0
Merchant bars	1.63c	6 15 0	.69c	3 2 6
Structural shapes	1.78c	7 7 6	.63c	2 17 6
Plates, †¼ in. or 5 mm.	1.94c	8 0 0	.89c	4 1 0
Sheets, black, 24 gage or 0.5 mm.	2.24c	9 5 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	2.72c	11 5 0	1.60c to 1.76c	7 5 0 to 8 0 0
Bands and strips	1.88c	7 15 0	.83c	3 15 0
Plain wire, base	2.24c	9 5 0	1.18c	5 7 6
Galvanized wire, base	2.66c	11 0 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.90c	12 0 0	1.27c	5 15 0
Tin plate box 108 lbs.	$ 4.61	0 17 0	.....	.....

British ferromanganese $82 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.94	3 2 6	(a) $13.91	215	$14.06	305	$24.85	63
Basic bessemer pig iron	15.99	2 19 0	(a)* 11.97	185	13.37	290	27.42	69.50
Furnace coke	4.07	0 15 0	7.76	120	5.07	110	7.59	19.25
Billets	29.13	5 7 6	26.20	405	20.28	440	38.07	96.50
Standard rails	2.00c	8 5 0	2.03c	700	2.31c	1,100(b)	2.36c	132
Merchant bars	1.72c	7 2 6	1.62c	560	1.12c	535	1.97c	110
Structural shapes	2.12c	8 15 0	1.61c	550	1.12c	535	1.92c	107.50
Plates, †¼-in. or 5 mm.	2.06c	8 10 0	1.97c	680	1.42c	675	2.27c	127
Sheets, black	2.48c	10 5 0§	2.47c	850‡	1.58c	750‡	2.58c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.09c	12 15 0	4.21c	1,450	3.15c	1,500	6.62c	370
Plain wire	2.12c	8 15 0	3.28c	1,130	2.73c	1,300	3.17c	177
Bands and strips	2.54c	10 10 0	1.89c	650	1.42c	675	2.27c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b Since January.

Bars

Bar Prices, Page 38

An unchanged market of 1.75c, Pittsburgh, on merchant steel bars for first quarter was announced last week by leading producers. Although some interests believe an advance should have been made, others contend that bar producers although operating at a loss under present conditions made a wise decision in not throttling prospective bar buying by another price advance.

It is generally conceded that bar producers can return profits at 1.75c, Pittsburgh, base, if sufficient volume develops. To important contract buyers who hold 1.60c contracts through fourth quarter, there will be a virtual advance of $3 a ton because beginning Jan. 1, 1934, 1.75c, Pittsburgh, will be the minimum on all bar business. Some discussion is heard of a possible advance to 1.90c on steel bars in late December or early January as the spot market for first quarter of next year. Alloy bars have been reaffirmed at 2.45c, Pittsburgh, for first quarter.

Soft steel bar sales and specifications at Chicago are steady in contrast to the decrease usually experienced at this period and the outlook for better demand from some industries next month is favorable. Nash Motors Co. has resumed operations at Kenosha, Wis., following a ten-day shutdown resulting from a strike.

Little change is noted in requirements of farm implement manufacturers. Most recent bar orders have been for miscellaneous uses. First quarter prices are being continued at 1.80c, Chicago, for soft steel and 1.70c for rail steel bars.

In eastern Pennsylvania ship work and railroad buying are expected to continue large factors in demand but manufacturing consumers may restrict specifications in view of inventory at the year's end.

Specifications for soft steel bars in New England show little change but in a number of instances current contract coverage is light and will be specified out fully.

Bids will be opened Dec. 1 on 600 tons of black and galvanized bars for delivery to the Brooklyn, Philadelphia and Charleston, S. C., navy yards, the larger part going to Brooklyn.

Railroad and automobile orders at Cleveland are limited to occasional carlots, although the Cleveland producer continues to ship by boat to the Detroit district on contracts. Though bars have been reaffirmed at 1.80c, base, Cleveland, for first quarter, the fact that a substantial portion of the tonnage now being shipped was booked before prices were advanced $3 a ton makes it certain that producers will receive more for their material in the first quarter than in the fourth quarter of 1933. This is expected to result in full specifications over the remainder of the year.

Plates

Plate Prices, Page 38

Uniformly, Pittsburgh plate producers, or those selling on a Pittsburgh base, submitted a base of 1.70c, Pittsburgh, on several thousand tons for the Pennsylvania, Nov. 23. An allowance of 0.0295c per pound from Pittsburgh was made to the railroad for its own haul, not

FREE CUTTING SCREW STOCK

A modified Bessemer made Screw Stock developed to meet the need of the average part fabricated on an Automatic Screw Machine—It will be found to machine to a bright smooth finish presenting a very good tool life between grindings. The price of this steel is exactly the same as you now pay for SAE-1112.

For extreme high speed screw machine production, we recommend the use of Ultra-Cut Screw Stock.

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Harvey, Ill. Buffalo, N. Y.

Sales Offices in all principal cities

Rounds Squares Flats Hexagons

COLD DRAWN STEELS

only on the plates but on the bars and shapes which were bid. A total of 4500 tons of these products, mostly plates, was contained in the inquiry.

For first quarter plates have been reaffirmed at 1.70c, Pittsburgh. Tank work is slow and river barge prospects have quieted. With the exception of inquiry in the Chicago district, there is little pending on the Mississippi and Ohio rivers in the way of new barges. American Bridge Co. is beginning repairs to eight more Carnegie Steel Co. barges at Ambridge, Pa., shops, the job using 285 tons.

Cleveland plate mills operated a few days last week on an accumulation of miscellaneous orders. Railroads are taking little material and the general market is quiet. Prices have been reaffirmed for first quarter.

Plate business at Chicago is principally of a miscellaneous nature. Additional municipal water tanks are pending as a result of federal loans but awards are small. Eight barges for the Illinois Barge Line Co. are pending, with several additional inquiries in prospect. Plates are unchanged for first quarter at 1.75c, Chicago.

Plate specifications in New England are light but needs for large tanks are heavier. Several water storage projects promise tonnage. Prices are steady at 1.80c, Coatesville, Pa.

Taking of plate tonnage for shipbuilding in the New York district is still interfered with by yard strikes. Some distillery demand is met in a slow market for tanks.

Eastern Pennsylvania plate mills have much tonnage in prospect for naval and other marine work. Bids on about 14,000 tons for the navy, for cruisers and gunboats, were postponed from Nov. 24 to Dec. 1. This may have been to obtain longer delivery on some of the tonnage. Most plates for the seadrome unit now authorized, will be universal plates for flooring.

Contracts Placed

1214 tons, armor plate, navy, 611 tons, to Bethlehem Steel Co., Bethlehem, Pa.; 420 tons to Midvale Co., Philadelphia, and 183 tons to Carnegie Steel Co., Pittsburgh; all class B except 80 tons class A included in tonnage awarded Bethlehem Steel Co.

285 tons, knuckle and bottom plates, repairs to eight Carnegie Steel Co. barges, to American Bridge Co., Pittsburgh.

220 tons, 55,000-barrel tank, Pan-American Petroleum & Transport Co., East Rutherford, N. J., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

6065 tons, medium black and galvanized plates, bureau of supplies and accounts, navy department; delivery, Brooklyn, Philadelphia and Charleston, S. C.; bids postponed to Dec. 1 from Nov. 24.

2500 tons, liner plates, metropolitan water district, Los Angeles; bids opened.

700 tons, eight barges, Illinois Barge Line Co., Chicago.

600 tons, four tugs for coast guard; bids opened.

450 tons, two fuel oil tanks, bureau of yards and docks, navy department, for Melville, R. I.; Wheeler Engineering Co., New York, low at $84,787; bids Nov. 22.

100 tons, 20 large buoys, lighthouse bureau, Staten Island, New York; Union Boiler & Mfg. Co., Lebanon, Pa., and Marion Machine, Foundry & Supply Co., Marion, Ind., recommended for contract, to be divided.

Unstated tonnage, 2,750,000-gallon steel standpipes, Kenosha, Wis.; bids Dec. 1.

Railroads

Track Material Prices, Page 39

Actual placing of rail orders has been slowed in a number of instances by preliminary work necessary in obtaining government loans. Several roads in the market for rails will buy from their own funds and not require government assistance. Delaware, Lackawanna & Western will open bids Dec. 4 on 12,000 tons of rails and 3600 tons of accessories, which will be paid for independent of the government.

No distribution of some 159,000 tons of steel rails and miscellaneous steel products on which the Pennsylvania has taken bids is expected for several days as bids have been sent to Washington for examination by Co-ordinator Eastman.

Rail mills in the Chicago district are operating steadily at a low rate but pending rail negotiations promise an improved schedule soon.

Rail mills at Birmingham, Ala., are reported to have booked some rails, including an export order for 6500 tons.

Car builders believe more than 50,000 cars will be bought under the federal program but definite information is not available. The Pennsylvania is preparing to start construction at its Altoona, Pa., shops of the 500 special automobile box cars previously described. Of the 7000 freight cars for this road, apparently all to be built in its own shops, 5500 are to be box cars.

Releases at Cleveland for repair materials is fair, but no inquiries have come out for rails or fastenings from carriers with headquarters in Cleveland, and it is believed now that no buying will be done there until after the first of the year.

An amendment to the steel code has been formulated for early approval, to permit quoting on railroad steel requirements over a 6-month period instead of the 3-month quarterly contract. The need was brought on by the inquiry of the Pennsylvania closed Nov. 23 for over 150,000 tons of steel, on which delivery was requested through all of 1934.

Producers of rolled steel wheels and axles have reaffirmed prices for first quarter. Car plates, car shapes and bars have all been reaffirmed for first quarter at unchanged third quarter prices.

Track bolts have been advanced 15 cents, effective immediately, making the price at all basing points, 3.65c per 100 pounds. Other track fastening prices continue unchanged.

Car Orders Placed

New York Rapid Transit, one articulated 5-section train, to Edward G. Budd Mfg. Co., Philadelphia.

Rail Orders Pending

Delaware, Lackawanna & Western, 12,000 tons rails, 3600 tons fastenings; bids close Dec. 4.

Sheets

Sheet Prices, Page 38

All sheet prices have been reaffirmed for first quarter, Pittsburgh reports. A moderate increase in sales is noted for new automobile models.

Chicago reports first quarter sheet prices remain to be announced, quotations for that period not yet having been filed. Business has been fairly steady but improvement is lacking in most directions. Automotive requirements as yet reflect but little change. Specifications from farm implement manufacturers also remain light. Radio equipment manufacturers are operating at a higher rate.

At Philadelphia it appears that sheet consumers will have an opportunity to contract for their first quarter requirements at the present market, which to many will represent an increase over the prices last paid. However, it is considered possible that an increase will be announced later in the year to become effective on such new business as might develop in the first quarter. Sellers are anticipating some increase in

specifications, as a result of this situation.

Sheet buying in the New England district is light as are specifications, several of the larger consumers being less active, notably small oil tank fabricators.

At Cleveland steelworks operations still are supported mainly by automotive requirements. Shipments to automobile builders continue good, but new orders have not yet developed in volume.

Miscellaneous requirements account for a sheet mill production rate near 30 per cent at Cincinnati. New purchasing at St. Louis is in small quantities.

Sheet demand in the New York district is quiet, with some improvement in specifications expected as low-price contracts expire.

Semifinished Steel

Semifinished Prices, Page 39

Wire rods have been advanced $1 a ton to $36, Pittsburgh, for the first quarter. The advanced price becomes effective Dec. 4, other basing point differentials for wire rods also $1 higher for first quarter. Sheet bars, billets and slabs have been reaffirmed at $26, Pittsburgh, for the first quarter; as has skelp at 1.60c, Pittsburgh; tube rounds at 1.75c, Pittsburgh; and alloy billets at $49, Pittsburgh. Producers of semifinished steel filed these prices last week to become effective early in December. Shipments of semifinished steel have declined because of the lower demand from nonintegrated tin plate and sheet producers, and one leading Pittsburgh district works which had been on a sheet bar schedule for many weeks closed last week.

Tin Plate

Tin Plate Prices, Page 38

Tin plate will be advanced to $5.25, Pittsburgh, $5.35, Gary, Ind., and $5.90 Pacific coast ports, per 100-pound box, effective Dec. 1. These prices were filed last week with the American Iron and Steel institute.

The new Pittsburgh base of $5.25 compares with a contract price of $4.25 through 1933, and a spot market of $4.65 which has been in effect since August.

With the price settled for next quarter consumers are negotiating their requirements. A reflection of this is seen in the placing of an order for 35,000,000 tin cans by the Standard Oil Co. of New Jersey with the Continental Can Co. New York.

Long ternes have been advanced $7 a ton to 3.25c, base, Pittsburgh.

Cold Finished

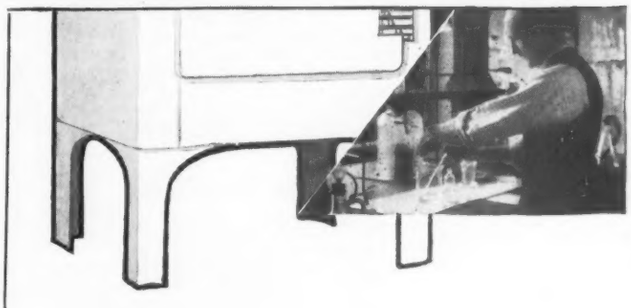
Cold Finished Prices, Page 39

Although cold-finished steel prices still are based on 1.95c, Pittsburgh, and 2.00c, Cleveland, Buffalo or Chicago, specifications were heavy last week, with the expectation that a $3 per ton advance will be made effective immediately.

An early decision on the advance is made necessary in view of the higher price at 1.75c, Pittsburgh, to be paid by nonintegrated cold-drawn bar producers will have to pay for hot-rolled bars for first quarter. An advance on cold-finished bars will affect base prices on turned and ground shafting. Cold-drawn alloy bars continue at 2.95c, base, Pittsburgh.

PORCELAIN ENAMEL

GOHI *Enameling Iron*
for all fine enameling..



ENAMELING GOHI SHEETS

The country's leading enamelers testify that GOHI Enameling Iron is made to meet the exacting demands of the porcelain enamel industry.

Because of the purity and satiny surface of Gohi Enameling Iron, fine enameling practice is reflected in perfect finished products.

Where exceptional forming or drawing qualities are essential GOHI Enameling Iron is the one logical choice.

It's the base metal that counts in the finish.

THE NEWPORT ROLLING MILL CO., NEWPORT, KY.

Shapes

Structural Shape Prices, Page 38

Prices of standard structural and wide flange shapes and steel sheet piling were announced last week as unchanged for the first quarter. These prices are 1.70c, Pittsburgh, for standard shapes; 1.80c, Pittsburgh, for wide flange shapes; and 2.00c, Pittsburgh, for piling. Current prices also were extended in other districts.

Structural awards in the Chicago district are heavy, largely due to the placing of about 7000 tons of shapes and piling for Mississippi river locks and dams. For the unit at Dresbach, Minn., 2500 tons of piling and 1100 tons of shapes have been placed, while 2500 tons of piling for Trempealeau, Wis., has gone to an eastern interest. New inquiries are headed by 1800 tons for a bridge at Joliet, Ill., 1500 tons of piling for Cape Fear, N. C., and 1500 tons for a garage and hangars at Shreveport, La.

Contractors at New York are slow to close on about 40,000 tons pending for four projects. Plain material is firm at 1.80c, eastern mill.

Award of 1100 tons for a high school at Wilmington, Del., is the largest noted in the Philadelphia district in several weeks, but early action is expected on a 2000-ton state bridge at Parker City, Pa.

Bids on three Cape Cod canal bridge superstructures are expected about Jan. 1, taking the largest tonnage required in New England for several years. Small-lot structural contracts there are more numerous.

New York state public service commission has approved revised plans for a Buffalo grade crossing project which call for an overhead steel viaduct, estimated to cost $670,000.

Bids are being taken Dec. 1 by the Ohio highway commission requiring 100 tons of shapes.

Contracts Placed

3600 tons, lock No. 7, Dresbach, Minn.; 2500 tons of piling to Inland Steel Co., Chicago; 1100 tons of shapes to Duffin Iron Co., Chicago.

2500 tons, piling, lock No. 6, Trempealeau, Wis., to Carnegie Steel Co., Pittsburgh.

2500 tons, four cranes, specification 7419, Pearl Harbor, T. H., to Star Iron & Steel Works, Tacoma, Wash.

1200 tons, high school, Wilmington, Del., to Belmont Iron Works, Philadelphia; Karno-Smith Construction Co., Trenton, N. J., general contractor.

1030 tons, lock 16, Mississippi river, Muscatine, Iowa, to R. C. Mahon Co., Detroit; Central Engineering Co., Davenport, Iowa., general contractor. Inland Steel Co. awarded 2500 tons of piling, reported in STEEL, Nov. 13. Concrete bars, 325 tons, still pending.

677 tons, three state highway bridges, New York; 370 tons to Lackawanna Steel Construction Corp., Buffalo; 177 tons to McClintic-Marshall Corp., Bethlehem, Pa.; and 130 tons to National Bridge Works, Long Island City, N. Y.

600 tons, cranes, Boulder dam, Boulder City., Nev., to Harnischfeger Corp., Milwaukee.

425 tons, bridge, Cutten county, Oklahoma to J. B. Klein Iron Foundry Co., Oklahoma City, Okla.

310 tons, state highway bridge, NRS-361A, North Carolina, to Carolina Steel & Iron Co., Greensboro, N. C.

290 tons, grandstand extension, Boston American Baseball club, Fenway park, Boston, to New England Structural Co., Everett, Mass.; Coleman Bros., Boston, general contractors.

270 tons, bridge, Walker and Echo, Minn., to American Bridge Co., Pittsburgh.

250 tons, state highway structure, Cambridge - Arlington - Belmont, Mass., section to McClintic-Marshall Corp., Bethlehem, Pa.; B. Perini & Son Inc., Framingham, Mass., general contractor.

180 tons, bridge, Long Island railroad, Forest Park, N. Y., to McClintic-Marshall Corp., Bethlehem, Pa.; Wilson & English, general contractors.

175 tons, building, Newport, Tenn., to Vincennes Bridge Co., Vincennes, Ind.

175 tons, bridge, Homer, Nebr., to Omaha Steel Works, Omaha, Nebr.

150 tons, bridge, Dakota City-Homer, Nebr., to Omaha Steel Works, Omaha.

135 tons, beam spans, Polk county, Iowa, to Des Moines Steel Co., Des Moines.

130 tons, state highway bridge, Alamo, Ga., to American Bridge Co., Pittsburgh.

125 tons, two bridges, Steuben county, New York, to Lackawanna Steel Construction Corp., Buffalo; through H. E. Bunce.

115 tons, overhead crossing, Ovid, Colo., to Minneapolis-Moline Power Implement Co., Minneapolis.

100 tons, shapes and bars, buildings, marine hospital, Portland, Me., to Megquier & Jones, Portland, and Sweet Steel Co., Williamsport, Pa.; R. W. Erickson, Philadelphia, general contractor.

Contracts Pending

4500 tons, lock No. 26, Alton, Ill.; bids Dec. 19.

3275 tons, bureau of supplies and accounts, navy, for Brooklyn, Philadelphia and Charleston, S. C.; bids Dec. 1, schedule 1187.

2000 tons, state bridge, Parker City, Pa.; bids opened Nov. 24.

1800 tons, Ruby street bridge, Joliet.

1600 tons, drum gates, Boulder dam, Boulder City, Nev.; Nashville Bridge Co., Nashville, Tenn., low.

1500 tons, steel sheet piling, wall, federal engineer project, Hickman, Ky.; bids Dec. 7.

1500 tons, piling, Cape Fear, N. C.

1500 tons, garage and hangars, Barksdale field, Shreveport, La.

1100 tons, lock No. 5, Quincy, Ill.; Joseph Meltzer Inc., New York, low on general contract.

1000 tons, lock, Genoa, Wis.; bids Nov. 28 to United States engineer office, St. Paul.

1000 tons, including plates, two motor cutters for Pacific Coast guard; Wallace Bridge & Structural Steel Co., Seattle, low.

890 tons, Campostella bridge, eastern branch, Elizabeth river, route 644, Norfolk, Va.; Sanford & Brooks Co., Baltimore, low.

800 tons, highway bridges, Indiana.

735 tons, ward building, General hospital, San Francisco; bids opened.

750 tons, stable and blacksmith shop, United States government, Fort Bragg, N. C.

500 tons, four highway bridges, Minnesota.

450 tons, cable towers, Coal Creek, Tenn.

425 tons, bridge, Sand Lake, Tex.

400 tons, bridge, Little Rock, Ark., for Missouri Pacific railroad.

400 tons, two 10-ton hammerhead cranes, Mare Island, Calif., specification 7540; bids Dec. 20.

400 tons, hangars and other buildings, Albrook field, C. Z.; bids Dec. 12.

400 tons, foundry extension, Pearl Harbor, T. H.; Ralph E. Woolley, Honolulu, low.

400 tons, Broad creek bridge, Pride, S. C., for Seaboard Air Line.

375 tons, state bridge, South Umpqua river, Oregon; Joplin & Elden, Portland, Oreg., low.

365 tons, state overhead crossing, Spokane, Wash.; bids Nov. 28.

350 tons, magazine building, Fort Sill, Okla.

300 tons, five cranes for Boulder dam, Boulder City, Nev., specification 549; bids opened.

250 tons, sheet steel piling, pier, quay wall and repair basin, Pearl Harbor, T. H.; Hawaiian Dredging Co., Honolulu, low on general contract.

225 tons, buildings, marine hospital, Fort Stanton, N. M.; Murch Bros. Construction Co., St. Louis, low.

220 tons, state highway bridge, Littleton, Colo.

215 tons, highway bridge, Lycoming county, Pennsylvania.

210 tons, state bridge, Black river, Maine.

200 tons, brewery, La Crosse, Wis.

190 tons, lumber shed, Philadelphia navy yard; McCormack, Lenhan Co., Philadelphia, awarded general contract.

185 tons, bridge, New Hampshire avenue, Washington; Arthur McMullen Co., New York, low.

170 tons, storage shed, Perth Amboy, N. J., for American Smelting & Refining Co.

150 tons, 90 tons shapes, 60 of bars, state bridges, Leflore county, Mississippi; bids Dec. 1.

150 tons, alterations to brewery, Atlas Brewing Co., Chicago.

140 tons, bridge, Broome county, New York, to American Bridge Co., Pittsburgh.

105 tons, underpass, Bexar county, Texas; bids in Nov. 27.

Unstated tonnage, miscellaneous build-

Shape Awards Compared

	Tons
Week ended Nov. 25	**15,077**
Week ended Nov. 18.	**28,092**
Week ended Nov. 11	**7,055**
This week in 1932	**8,494**
Weekly average, 1932	**14,285**
Weekly average, 1933	**14,392**
Weekly average, Oct.	**14,719**
Total to date, 1932	**777,465**
Total to date, 1933	**691,203**

ings, Fort Humphrey, Va.; R. B. McDaniel Construction Co., New Brighton, Pa., general contractors.

Reinforcing

Reinforcing Bar Prices, Page 39

At Pittsburgh action is contemplated to advance the price of new billet steel for reinforcing purposes $1 a ton, thus placing the market for mill lengths at 1.85c, Pittsburgh, and on cut lengths at 1.95c, Pittsburgh. The base of 1.85c has been suggested to provide the actual price to the mills from distributors at 1.65c, or with the usual deduction of $4 a ton.

It has been the intention of producers there to establish the market on reinforcing bars to distributors at $2 a ton under the merchant steel bar market of 1.75c, Pittsburgh, whereas now it is $3 a ton under. However, considerable discussion still is hinging around the distributors' code of fair competition, which has not yet been approved.

A change in new billet steel reinforcing bar quantity extras is being made, providing graded quantity classifications with proportionate extras for lots under carload. This plan is similar to that enforced on rail steel bars for reinforcing purposes.

Demand for reinforcing steel at Pittsburgh is declining somewhat but prospect of fresh releases on government work provides some encouragement.

Chicago reports concrete bar prices for the first quarter are to be continued at present levels of 1.95c for cut lengths of billet bars, and 1.80c for rail steel bars, according to figures filed recently. Starting Dec. 1 contractors will be quoted on cut lengths of billet bars only rather than have the option of buying mill lengths. Awards and inquiries there remain rather light.

Quotations on the third Cape Cod canal bridge substructure go in this week, a New York contractor being low on the substructures for the two highway spans. These projects take close to 2000 tons of reinforcing bars.

Reinforcing bar sellers at New York are figuring more work, although current buying is light. Highways and bridges in New York and New Jersey account for the bulk of the volume active.

Contracts Placed

1800 tons, southwest outfall sewer, Louisville, Ky., to Kalman Steel Corp., Bethlehem, Pa.

738 tons, lock and dam, Canton, Mo., to Concrete Steel Co., Chicago, and unstated interest.

600 tons, barracks, Fort Knox, Ky., to Concrete Engineering Co., Chicago.

200 tons, highway, Herkimer county New York, to American Steel & Wire Co., New York; through Law Bros. Contracting Corp.

200 tons, highway structures, Queens, New York, to Joseph T. Ryerson & Son Inc., New York.

183 tons, state highway work, Santa Barbara county, California, to unnamed interest.

180 tons, barracks, United States Military Academy, West Point, N. Y., to Concrete Steel Co., New York. Previously reported as being awarded to another fabricator.

140 tons, state road work, Pennsylvania, to Concrete Steel Co., Philadelphia; through H. R. Miller, Lancaster, Pa.

125 tons, Chartiers creek bridge, Carnegie, Pa., to Electric Welding Co., Pittsburgh; through John Kunz Co., Pittsburgh, general contractor.

100 tons, dam No. 3, Allegheny river, reported placed through Seeds & Durham, general contractor, Philadelphia, with Concrete Steel Co., that city.

100 tons, or more, officers' quarters, Barksdale Field, Shreveport, La., to Concrete Engineering Co., Houston, Tex.; Worsham Bros., Knoxville, Tenn., general contractors.

100 tons, bridge, Dry Run, Page county, Virginia, to Joseph T. Ryerson & Son Inc., New York; Boston Construction Co., South Boston, Va., general contractor.

100 tons, bars and shapes, bridge, highway No. 6 between Holly and Granada, Colo., to Virginia Bridge & Iron Co., Roanoke, Va., and Colorado Builders' & Supply Co.; Driscoll Construction Co., Pueblo, Colo., general contractor.

Contracts Pending

6500 tons, pier, quay wall and repair basin, Pearl Harbor, T. H.; Hawaiian Dredging Co., Honolulu, low for general contract.

1500 tons, substructures, bridges, Cape Cod canal, Bourne and Sagamore, Mass.; P. J. Carlin Construction Co., New York, low on two highway bridges, $1,337,000. Bids close Nov 29 on railroad lift bridge over canal at Buzzards Bay, Mass., with United States engineer, Boston.

900 tons, dry dock, navy yard, Philadelphia; general contract awarded to William Eisenberg & Sons, Camden, N. J., recently reported as low.

430 tons, seawall, Ellis Island, New York; bids in.

400 tons, Campostella bridge, eastern branch, Elizabeth river, route 644, Norfolk, Va.; Sanford & Brooks Co., Baltimore, low.

400 tons, hosiery workers' housing development, Philadelphia, which William Steele, Philadelphia, general contractor, is low, held up pending litigation.

200 tons, high school, Wilmington, Del.; Karno Smith Construction Co., Trenton, N. J., awarded general contract.

200 tons, state hospital, Manteno, Ill.; bids Dec. 5.

315 tons, wall, federal engineer project, Hickman, Ky.; bids Dec. 7.

250 tons, highway projects, various counties, Texas; bids in Nov. 27.

175 tons, state highway, New Hampshire; B. Perini & Sons Inc., general contractors.

142 tons, bridge, King county, Washington; plans completed.

Unstated tonnage, 7500 deformed steel reinforcing bars, bureau of reclamation, Denver, schedule 23022-A, bids Nov. 6; Soule Steel Co., Los Angeles, recommended as offering better delivery. All bids $51,133.14, f.o.b. Torrance, Calif.

Concrete Awards Compared

	Tons
Week ended Nov. 25	**4,386**
Week ended Nov. 18	**2,995**
Week ended Nov. 11	**2,100**
This week in 1932	**2,239**
Weekly average, 1932	**3,920**
Weekly average, 1933	**3,534**
Weekly average, Oct	**4,852**
Total to date, 1932	**196,825**
Total to date, 1933	**169,658**

Pipe

Pipe Prices, Page 39

Effective Dec. 1, at Pittsburgh, seamless steel boiler tubes will be advanced approximately $4 to $6 per ton on certain sizes. On 1 to 1¾-inch the advance will be two points, and on 3 to 4-inch, inclusive, three points. Large sizes are not affected, nor are any sizes of lapweld steel boiler tubes.

Pipe producers in the New York district have filed prices embodying advances of $6 per ton on merchant boiler tubes, 3 to 4-inch; $5 per net ton on steel tubes; approximately 6 per cent on refrigerator and condenser seamless tubes; and approximately $4 on 1½ and 1¾-inch, and $6 on 3, 3¼ and 4-inch lapweld boiler tubes.

Chicago prices on cast iron pipe have been advanced $1 a ton, 4-inch pipe now being quoted at $47 to $48, Chicago, with 6 to 24-inch material $44 to $45. Class A pipe continues $3 a ton over these figures. No change has been announced in the Birmingham base of $90 for standard fittings.

Republic Steel Corp. booked approximately 2500 tons of steel pipe last week in several miscellaneous orders for middle western gas lines. The inquiry from White Eagle Oil & Refining Co., Wichita, Kans., for 2500 tons still is pending. This producer also will fabricate about 50 tons of steel pipe for a state sani-

tarium heating system, Mt. Morris, N. Y.

Contract for 1800 tons of 42-inch cast pipe and a small volume of wrought iron and steel pipe will be placed this week through a contractor for a Bayonne-Jersey City, N. J., job.

Spurred by federal loans, cast pipe inquiry is slightly heavier in the Boston territory.

The Russian inquiry for about 50,000 tons of oil country goods is still pending, with about 20,000 tons indicated for producers in this country. Long-term financing probably will be stipulated, and domestic producers look on the business skeptically.

Cast Pipe Placed

300 tons, 8-inch, water line, naval air station, Pensacola, Fla., to McWane Cast Iron Pipe Co., Birmingham, Ala.; L. M. Harvey, Pensacola, general contractor.

200 tons, Ludlow, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

Cast Pipe Pending

2345 tons, 12-inch, Chicago; Glamorgan Pipe & Foundry Co., Lynchburg, Va., low.

600 tons, 6 to 12-inch, Warwick, R. I.; bids in.

550 tons, approximate, 6 and 12-inch, Paxton, Mass.; bids Nov. 27. Will also erect 365,000-gallon storage tank.

500 tons, 4 to 12-inch, Ionia, Mich.; Alabama Pipe Co., Anniston, Ala., low.

376 tons, Kenosha, Wis., booster plant; bids Dec. 1.

350 tons, 6 and 8-inch, Granite Falls, N. C.; bids Nov. 29. Will also erect 75,000-gallon steel tank on 100-foot tower.

300 tons, fittings, Chicago; Bessemer Foundry & Machine Co., Bessemer, Ala., low.

300 tons, mostly 12-inch, water and sewage system, state hospital, Woodburne, N. Y.; Ericksen Engineering Corp., New York, low on general contract.

Unstated tonnage, Auburn, Pawnee, Chatham, Windsor and Shelby, Ill.; $431,000 loan granted for water system construction and improvements.

Steel Pipe Placed

2500 tons, 6, 8 and 10-inch, for miscellaneous middle western gas lines, to Republic Steel Corp., Youngstown, O.

Steel Pipe Pending

Unstated tonnage, 370 lengths shore discharge pipe, 16 feet 3 inches per length, United States engineer, Philadelphia; bids Dec. 1.

Wire

Wire Prices, Page 39

Effective Dec. 4, merchant and manufacturers' wire products will be advanced $1 to $5 a ton. The following prices will be in effect at that time, Pittsburgh or Cleveland base, following filing of these advanced prices by leading producers, Nov. 22: Standard wire and cement coated nails, $2.35 per keg; galvanized nails, $3.85 per keg; bright plain wire to the manufacturing trade, 2.20c per pound; and the following on a pound basis: Galvanized fence wire, 2.80c; annealed fence wire, 2.35c; galvanized barbed wire, 2.85c; galvanized fence staples, 3.30c; polished staples 3.05c; and spring wire 3.20c. Woven wire fencing, 9-11 gage, will be $60 per base column, carloads. Wire rods will be $36 per ton.

Other prices filed include: Cast steel rope wire, 4.25c; plow steel rope wire, 4.75c; high carbon spoke wire, 3.20c; core wire, 4.00c, all Pittsburgh base; high carbon basic wire, 3.75c, Chicago; finished annealed fuse wire, 11.45c, Cleveland. These prices are all effective Dec. 2.

The wire trade was generally informed of the advance some three days before actual filing, driving in specifications in considerably better volume last week.

Producers at Cleveland expect a considerable improvement in new orders and specifications on contracts, due to the advance in prices. They believe December will be a better month than November.

Demand has shown some increase at Chicago, larger lots being taken by the various classes of consumers.

Eastern Pennsylvania consumers have fairly substantial stocks but the advance in prices brought some added specifications last week.

John A. Roebling's Sons Co., Trenton, N. J., has been awarded 200 tons of 7/16-inch plain steel strand for the federal engineer at Vicksburg, Miss., at $40,640, delivered, Greenville, Miss.

Of 40,536 gross tons of scrap exported from the United States in September, Japan took 32,493 tons, Canada being second with 4239 tons.

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Pig Iron

Pig Iron Prices, Page 40

Considered more as an adjustment than an advance, all grades of pig iron in the Boston territory were marked up 50 cents, Everett, Mass., base, effective Dec. 1. Sellers of Indian iron will follow the new price schedule.

Advances of $1 per ton have been filed on basic, foundry, bessemer and malleable iron at Swedeland, Bethlehem and Birdsboro, Pa., on basic and foundry grades at Sparrows Point, Md., and on low-phosphorus at Steelton, Birdsboro and Standish. New quotations are effective Dec. 1.

Producers in the Pittsburgh district have reaffirmed present prices: $17.50, Neville Island, for basic; $18 for foundry and malleable grades; and $18.50 for bessemer. Gray forge iron continues into 1934 at $17.75, same base.

Chicago reports that present prices are expected to hold unchanged for first quarter. New business is light but shipments are well maintained. It is pointed out that the credit situation is becoming increasingly prominent due to the fact that some consumers are under contract to take more iron than their requirements warrant.

A watchful, waiting policy has been adopted by Cleveland furnace interests, who have not filed new prices for first quarter since this is not necessary unless a change is to be made. Shipments from lake furnaces this month will exceed the October tonnage and producers believe the movement in December will be substantially larger than that of November.

Several barge loads of iron were shipped from Buffalo to the eastern seaboard last week, an unusually late movement and possibly presaging improved conditions in the market during the winter months.

Little interest is shown in buying in the Cincinnati district as producers prepare to open books for first quarter. No price change has been indicated.

No business is reported as yet for first quarter delivery at Birmingham, Ala., wth current orders confined to small lots.

Daily melt in Toronto, Ont., foundries is holding around 30 per cent of capacity, with little improvement in sight. Inquiries for pig iron are only for immediate needs.

Business of stovemakers in the St. Louis district is reported 58 per cent above the same period of 1932, contributing toward maintaining good shipments of pig iron. New buying still is scarce.

With settlement of the eastern price situation for the first quarter, and with most importers of foreign iron now apparently quoting on a parity with the domestic market, shipments and new business are expected to improve, according to reports from Philadelphia. Pennsylvania railroad is expected to close shortly on 200 tons of foundry iron.

Coke

Coke Prices, Page 39

Slightly heavier demand for furnace coke has been noted recently at $3.75, Connellsville ovens, base. No appreciable upturn is reported in foundry grades and nominal prices continue at $4.25 for common grades and $5.25 for premium brands.

By-product foundry coke shipments

Carbon and Alloy Steels
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continue slightly below the October rate at Chicago, reflecting the trend in foundry operations. While December prices have yet to be announced, the market is expected to continue at $8.50, ovens, for outside delivery and $9.25, delivered Chicago.

Metallurgical coke is moving at St. Louis in better volume than had been expected in view of reduced plant operation. Stocks are fairly large.

Scrap

Scrap Prices, Page 41

Pittsburgh — Scrap showed some strength here last week when a district melter purchased a small tonnage of No. 1 railroad steel at $11.50 and signified its intention of purchasing several thousand tons additional at the same level or slightly higher. However, sellers' bids for the additional tonnage were at least 25 cents a ton higher. Machine shop turnings have likewise firmed up from a recent spotty condition where as low as $6 was offered. The market is now quoted between $7.50 and $8. Cast grades remain quiet and unchanged with heavy breakable between $10 and $10.50.

Cleveland—Dealers and consumers of steel and iron scrap alike are not inclined to commit themselves beyond immediate needs and prices are firm and unchanged. Melters are a shade more approachable with offers but the situation is not yet sufficiently clear to bring general covering. Most movement here is of blast furnace grades and a small proportion of heavy steel.

Chicago—Scrap buying by larger consumers is unimproved and shipments against orders still are restricted. Fairly large tonnages remain to be delivered but with consumption unimproved, there is little interest in new commitments. Inquiries from steel foundries are more active but only relatively small lots have been sold. Prices of most grades are untested with heavy melting steel nominally $8 to $8.50

Boston—Shipments of scrap outside New England are light. The Worcester, Mass., consumer continues $7, delivered, as the top for No. 1 heavy melting steel, taking limited, but steady shipments. Some heavy cast is also being moved at $8, delivered. Most grades are dull with prices untested, notably machine turnings.

New York—Buying of breakable and machinery cast scrap by Bethlehem Steel Co., requirements for cast iron segments for the Hudson river tunnel, accounts for most activity by domestic scrap consumers. Buying for export continues to lead with barge prices for heavy melting steel grades unchanged.

Philadelphia—Export buying still features scrap trading here. In addition to 5000 tons of No. 1 steel to have left here last week for ultimate shipment to Japan, 1500 tons of No. 1 steel and 1500 tons of No. 2 steel are scheduled to leave here within a fortnight or so for Japan. Still further export buying is anticipated. Export prices on No. 1 and No. 2 steel to date have been respectively, around $8.75 and $7.50 f.a.s. With the domestic market continuing to ease off, a reduction in export prices is expected.

Buffalo—Scrap markets are dormant. Mills continue to hold up shipments on some grades and there is no buying. Dealers ask considerably higher prices than open offers of larger consumers. A nominal price list again prevails.

Detroit—Iron and steel scrap here continues lifeless. Offerings from automobile plants are beginning to expand as work is started on new models. If offerings increase appreciably they may further weaken the market. But for the long pull the trade is hopeful and believes prices a year hence will be higher than today.

Cincinnati — Prices of iron and steel scrap are unchanged but nominal with few consumer purchases. The principal activity is in dealers covering on contracts.

St. Louis—Iron and steel scrap continues dull, with prices uncertain and lacking test on most items. No revisions in quotations have been made recently and absence of heavy offerings, with practically no distress material gives a semblance of steadiness. Considerable southern scrap, usually coming to this market, is being purchased by exporters, for shipment via Gulf ports and the Panama canal to Asia and Australia.

Birmingham, Ala. — The scrap market is at a standstill, with occasional movement of heavy melting steel or No. 1 cast. Prices are weak but no changes are noted.

Toronto, Ont.—Trading in iron and steel scrap is practically at a standstill. Demand is specialized with orders in small lots. Dealers are out of the market and prices are unchanged.

Simplified practice recommendation R71-28, covering turnbuckles, diameter and opening, has been reaffirmed without change by the standing committee of the industry through division of simplified practice of the bureau of standards.

Warehouse

Warehouse Prices, Page 42

Expected advances in the warehouse schedule at Pittsburgh have not materialized. Owing to a higher mill price on wire products and tin plate next quarter, these products will be advanced on a warehouse basis. In the meantime, nails remain at the less-carload mill rate of $2.40, Pittsburgh warehouse, with black wire 2.50c, and galvanized wire 2.60c.

Demand for warehouse steel at Pittsburgh in November has been ahead of November, 1932 but on the average not more than half what it was last summer.

Cleveland warehouse interests report the number of orders, tonnage, and shipments have diminished, with prices steady. Public work in and nearby Cleveland has resulted in a heavy demand for shovels and other hand tools for road work, according to hardware jobbers.

Galvanized, polished, corrugated and special finished sheets have been advanced by Boston warehouses. No. 24 hot-rolled sheets are now 4.00c, No. 24 blue sheets 4.50c, and galvanized 4.60c. Warehouse volume, is slightly below the recent rate.

Business of iron and steel warehouses at St. Louis has been gradually receding since October, with recent volume the smallest since spring. Galvanized sheets are slightly more active than other flat-rolled steel.

Demand at Detroit for iron and steel out of warehouse continues at the October level, improved requirements of tool and die shops and automobile manufacturers starting on new models offsetting a slight dip in general needs. Prices are unchanged.

Warehouse volume at New York, with few exceptions, is slightly under last month, although some jobbers note a well sustained demand from smaller shipyards. Prices are steady and unchanged.

While sales at Chicago are declining, the decrease is less than seasonal. Heavier buying prior to recent price increases so far has had little effect upon sales.

Tonnage from warehouses at Cincinnati is holding close to the October level, on miscellaneous industrial demand.

Pacific Coast

Pacific Coast Prices, Page 39, 40, 42

San Francisco—(*By Air Mail*)—With the approach of winter, some falling off in demand for steel products is expected. Awards were not numerous during the past week, although some heavy tonnages are up for figures or pending. Prices are steady.

Concrete bar lettings exceeded 700 tons. Among the larger lots were 183 tons and 177 tons, respectively, for state highway work in Santa Barbara and Santa Clara counties, California, placed with unnamed interests. Hawaiian Dredging Co. was low bidder on 6500 tons of reinforcing bars and 250 tons of sheet piling for a repair basin, pier and quay wall at Pearl Harbor, T. H.

Bids have been opened on 2500 tons of plates for tunnel lining for metropolitan water district, Los Angeles, and on 600 tons for four tugs for the coast guard. A call for bids on close to 17,000 tons for the Hetch Hetchy project. San Francisco, is expected within the next few days.

Pending business in shapes aggregates over 20,000 tons. Bids have just been opened on 2000 tons for drum gates for Boulder dam, on 735 tons for a ward at the General hospital, San Francisco, and on 400 tons for a foundry extension at Pearl Harbor, T. H. New inquiries include 400 tons each for cranes at Mare Island and hangars at Albrook field, C. Z.

Little new business in cast iron pipe is looked for during the remainder of the year. Activity in steel pipe is not pronounced.

Projects Show Increase

Seattle—While iron and steel awards in the Pacific Northwest were small this week, prospects are improving with tonnages pending showing an increase. Opening of bids for the navy pier at Pearl Harbor, T. H., is of local interest as Seattle mills expect to furnish some of the reinforcing and other materials required.

Star Iron & Steel Co., Tacoma, was low for four large cranes for this project on a bid of $257,480. Wallace Bridge & Structural Steel Co. is low for construction of two of the four additional coast guard cutters.

Pending steel tonnages include 825 tons for a motorship for Northland Transportation Co., Seattle, contract for Lake Washington Shipyards, Seattle. Reinforcing steel specifications are light.

Road and bridge construction offers possibilities for much steel buying in moderate lots and projects now under way are many.

Wholesale jobbers report a small turnover as the trade goes into the usual quiet holiday period. Business is in unimportant tonnages, all out of stock, mill buying being at a minimum. Prices are firm and upon adoption of the industry's code it is expected that differences with the Portland area will be adjusted. Business has been greatly stabilized under the tentative warehouse code provisions.

Water main projects are developing slowly although the need for cast iron pipe is almost acute in many communities. Yakima, Wash., and Canby, Oreg., open bids Nov. 27 for moderate tonnages.

Demand for scrap continues strong in the Oriental markets, differences in exchange stimulating the movement to Japan. Rails are in best demand although all kinds of old material can be sold. The local movement of scrap has not improved.

Steel in Europe

Foreign Steel Prices, Page 42

London—(*By Radio*)—Increased demand for steel necessitates heavier production, and Dorman, Long & Co. are reopening their steelworks at Acklam after three years idleness. The English Steel Corp., Sheffield, is starting improvements at its Sheffield works to cost £500,000. They include enlargement of the drop-stamping works and facilities for heat treatment of special steels.

Sales of East Coast hematite have been made for delivery into March. Germany, Holland and Sweden are competing in foreign markets. Russia has placed an order for 4000 tons of tramrails. The Midland market is firm and billets have been sold into March.

Continental steel is reappearing in British markets, due to scarcity of domestic material. The Scottish market is quiet. The Continent reports export markets are quiet with British purchases more active. Germany is selling specialties in various markets.

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Strip

Strip Prices, Page 39

All prices on steel strip have been reaffirmed for first quarter, although an advance had been looked for by some interests. This establishes 1.75c, Pittsburgh, for hot-rolled and 2.40c, Pittsburgh, for cold-rolled.

Buying from producers at Pittsburgh is closely restricted and little tonnage has come out from automotive interests at Detroit.

In eastern Pennsylvania important consumers have contracts sufficient to cover their needs to the end of the year and buying is light. Present prices of 2.04c, Philadelphia, on hot-rolled, and 2.64c, Philadelphia, on cold-rolled have been extended to cover first quarter.

Automotive demand for strip shows little change in the experience of producers at Chicago and the market is quiet. Miscellaneous users are specifying in small lots.

New England strip consumers are well provided with stocks specified several weeks ago and current demand is light.

More inquiry of a miscellaneous character is developing at Cleveland. Shipments on fourth quarter contracts are holding up, but new orders from the automotive industry are scarce. Producers still are uncertain as to the first-quarter price policy.

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Bolts and Nuts

Bolt, Nut, Rivet Prices, Page 39

Track bolts were advanced 15 cents per 100 pounds last week to 3.55c, Pittsburgh, although other bolt, nut and rivet prices are unchanged. Producers believe first quarter prices will not be announced before Dec. 10. Many bolt and nut producers will face an advance in bar stock for first quarter as buyers at 1.60c base, Pittsburgh, will be quoted 1.75c, Pittsburgh.

Oliver Iron & Steel Corp., Pittsburgh, has not yet received a contract on 1800 tons of bolts and nuts for the New York port authority on which its bid was low. The unchanged schedule includes 70 off for bolts and nuts, 70 and 10 off on small rivets and 2.75c base, Pittsburgh, or 2.85c, Chicago, for large rivets.

Specifications and orders at Cleveland have improved, mainly from automobile manufacturers and railroads.

While inquiry at Chicago is fairly active as a result of better interest on the part of railroads, incoming business is quiet and shipments slow and unimproved. Farm implement manufacturers are taking slightly larger lots.

Quicksilver

New York — Quicksilver prices are lower due to selling pressure in the market. Following reports of round lots sold as low as $54, a virgin flask of 76 pounds, increased buying developed during the past few days and the market now is quotable at $64.50 to $65.50 a flask on round lots, and 50 cents higher on small lots.

Metals

Nonferrous Metal Prices, Page 40, 41

New York—Nonferrous metals held fairly steady last week with the exception of tin. Consumers showed no inclination to enter the market actively, however, in view of the uncertainty hovering over the administration's monetary policies.

Copper—The light business done was at the ruling price of 8.25c, Connecticut, quoted by custom smelters. Shaded bids might be accepted in some directions, it was indicated. The copper code committee still was at work but was able to arrive at no generally acceptable plan. Copper and brass product demand was comparatively light.

Lead—Demand was confined mostly to carlots but the market retained a steady tone. Most of the business was for December shipment. Stocks rose 8500 tons further in October.

Zinc—Prices developed a firmer appearance although buying was only moderate. Some sellers asked a premium on metal for shipment after the first of the year. Many of the mines in the Tri-State area have closed down.

Tin—Quotations from day to day were uncertain due to the fluctuations in sterling exchange. Prices eased off toward the close of the week.

Antimony—Little test of the market was offered and prices held.

Aluminum—Buying was quiet but prices held.

Coke By-Products

Coke By-Product Prices, Page 39

New York—Contracting for benzol and toluol for the first half of 1934 is being done at unchanged prices. Commercial xylol also is unchanged for that period. Demand for and consumption of distillates is fair. Consumers of naphthalene are covering for next season's needs. Phenol prices are firm with the bulk of current output moving into consuming channels.

Here and There In Industry

COMBUSTION ENGINEERING CO. INC., 200 Madison avenue, New York, has formed a marine department in charge of Commander Horace T. Dyer. It will take over the work previously handled by the marine division of Combustion Engineering's subsidiary, Hedges-Walsh-Weidner Co., Chattanooga, Tenn. It will provide complete service to the marine field in connection with the company's sectional header, bent tube and other types of boilers and related equipment. Commander Dyer is a graduate of Annapolis, resigning from naval engineering work in 1923. Since then he has been connected with Peabody Engineering Co., New York, and Gibbs & Cox, naval architects and engineers, New York. James S. Malseed, marine representative of the Hedges-Walsh-Weidner Co. at Washington, will continue as representative of the new division, with offices in the Mills building, Seventeenth street and Pennsylvania avenue.

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Pack-Morin Inc., 261 Fifth avenue, New York, has been retained by the Coca-Cola Co., Atlanta, Ga. to design special equipment pertaining to products of the latter.

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Monteith Bros., Elkhart, Ind., manufacturer of automobile parts, is moving from its present plant to the former Elkhart Paper Co. building to obtain larger space for increased production.

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Inland Steel Co., Chicago, has appointed A. M. Castle & Co., Chicago, exclusive sales agents for Inland products on the Pacific coast through their offices at Los Angeles, San Francisco and Seattle.

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Pittsburgh, Foundrymen's association will hold its annual Christmas party at the Ft. Pitt hotel, Pittsburgh, Monday evening, Dec. 18. C. W. Paul, Mackintosh-Hemphill Co., Pittsburgh, is secretary.

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King Stove & Range Co., Sheffield, Ala., has added 50 men at its stove and foundry plant, making the largest number employed since 1929. Martin Stove & Range Co., Florence, Ala., owned by the same interests, has 100 men on full time.

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Lavelle Foundry Co., Anderson, Ind., Linfield Myers receiver, has asked court permission to sell four foundries, including real estate, buildings and equipment. They are located at Indianapolis and Argos, Ind., and two are at Anderson, Ind.

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Alvin DeVilbiss Gutchess, president of the DeVilbiss Co., Toledo, O,, manufacturer of atomizers and spray-painting equipment, on his return from a six weeks trip to London, Paris and Barcelona, states business is improving in England and his company has received several promising orders from Italy.

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Gisholt Machine Co., Madison, Wis., manufacturer of machine tools, was at work at the time of American recognition of the Russian government on an order for $20,000 worth of turret lathes for the Soviet government, not contingent on recognition, part of a series of sales. Six weeks ago this company shipped a $5000 consignment and about a year ago filled an order for lathes totaling about $75,000. Rumors of an order contingent on recognition are denied.

Equipment

Machinery and equipment inquiry from the navy department continues heavy, but it is reported that some dealers are paying less attention to this business, with an improvement in private industrial inquiry.

Grinding machinery builders are fairly active in the Worcester, Mass., district. Ball bearing producing plants are contemplating heavier schedules. A refrigerator builder in the East, making model changes, has purchased some new grinding machinery. An inquiry for Russia also is out, involving tools for production of an air-cooled engine.

Considerable heavy used machinery at the E. W. Bliss Co. plant, Brooklyn, N. Y., is being sold. Some dealers in New York booked export business last week, and 14 machines were purchased recently for the experimental radio shop, R. C. A. building, New York.

A plate mill in the Pittsburgh district continues to have under consideration the widening of roll stands to accommodate rolling for a much wider sheared plate. Heavy steel mill equipment builders in this district are described as hopeful but not too enthusiastic over prospective business from Russia. Domestic steel producers continue hesitant about going ahead with previously made plans for equipment changes.

Bids on four 300-ton cranes and one 50-ton crane for Boulder dam were opened in Denver, Nov. 17, by the bureau of reclamation. Quotations have been forwarded to Washington, from which point the award will be made.

Ferroalloys

Ferroalloy Prices, Page 40

While many in the trade are confident that there will be an advance in ferromanganese for next year, no official notice has been issued and it may be early in December before anything definite develops. Meanwhile, the market is $82, seaboard, on car lots. Domestic spiegeleisen, 19 to 21 per cent, also remains unchanged at $27, furnace, for spot delivery.

NONSHRINK OIL HARDENING

TOOL STEEL TUBING

Manufacturers of BISCO Tungsten Carbide and Tantalum Carbide drawing dies for wire, rod and tubing.

A saving will be realized by using our Tool Steel Tubing. Carried in stock up to 12″ O.D. x 2″ wall thickness. It is excellent for all classes of dies, slitters, spacers, bushings, etc.

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Construction and Enterprise

New Jersey

CLIFTON, N. J.—Eureka Machine Co, Inc. has been incorporated with $10,000 capital to manufacture machinery, by Charles P. Hebenstreit, agent, Clifton, N. J.

Pennsylvania

MEADVILLE, PA. — City, M. Gill, mayor, plans a viaduct across Mill run connecting North and Walnut streets at Porter street, to cost $75,000 to $100,000. PWA financing is sought.

PITTSBURGH—Bids will be reveived until Dec. 12 by United States engineer for construction of Montgomery dam in the Ohio river.

Ohio

EAST HAMILTON, O.—Core room of the Hamilton Foundry & Machine Co., Lincoln avenue, is being rebuilt after destructive fire, with loss estimated at $50,000.

NEW PHILADELPHIA, O.—Removal of the Harrold Machine Co., Wooster, O., to New Philadelphia is being arranged by R. R. Jewell and a committee of the chamber of commerce. Its output is machinery products for manufacturers of metal products.

Michigan

CHEBOYGAN, MICH.—Midwest Distilleries Inc. has been incorporated with $50,000 capital to operate a distillery, by Nathan R. Berke, 757 Covington drive, Detroit.

KALAMAZOO, MICH. — Kalamazoo Stove Co. is preparing to build an addition to its plant, to cost $10,000.

LAPEER, MICH.—Michigan Light & Power Co., Lapeer, Mich., will rebuild immediately the fire damage of about $10,000 at its plant.

MENOMINEE, MICH.—Plans have been drawn by Francis Engineering Co., Saginaw, Mich., for a municipal electric light and power plant here, to cost $650,000. A federal loan is being sought.

Indiana

CONNERSVILLE, IND.—Steel Kitchens Corp., Waukegan, Ill., is moving its plant to Connersville, occupying the plant of the Indiana Lamp Co. Equipment is being received for installation.

Illinois

CHESTER, ILL.—City plant municipal electric light and power plant to cost $158,000. Loan asked from PWA. W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, is consulting engineer.

FREEPORT, ILL.—Rothstein Iron & Metal Co., 118 North Commercial avenue, has been incorporated with 30 shares capital stock to deal in steel, iron and metals, by Louis B. Rothstein and associates. Oscar Zipf, 311 Second National Bank building, is correspondent.

Missouri

BUTLER, MO.—Approval by PWA has been obtained for a waterworks system to cost $550,000. Shockley Engineering Co., 800 Graphic Arts building, Kansas City, Mo., is engineer.

ST. LOUIS—Board of estimate and apportionment has approved a bill appropriating $50,000 for construction of a reinforced concrete viaduct carrying Ivory avenue over Missouri Pacific tracks in South St. Louis, costing $150,000, United States government furnishing $100,000.

Oklahoma

ARDMORE, OKLA.—B. & F. Tank Co. has been incorporated with $2000 capital by C. B. Kidd, attorney, Colcord, building, Oklahoma City, Okla.

TULSA, OKLA.—Oklahoma Union Railway Co., through Union Salvage Co., has sold its 14-mile track and equipment to Texas Railway Equipment Co., Houston, Tex., which is dismantling it.

TULSA, OKLA.—Skelly Oil Co., skelly building, Tulsa, Okla., announces it will build a six and eight-inch pipeline, 48 miles long, from Burrton, Kans., to Cunningham, Kans. An absorption gasoline plant is being constructed, contract to Cooper-Bessemer Corp., Mt. Vernon, O., for five direct-driven engine compressor units. Investment will total close to $500,000. S. C. Snyder, care Skelly Oil Co., El Dorado, Kans., is in charge of pipeline construction and Emby Kaye, Skelly building, Tulsa, Okla., will supervise building of the gasoline plant.

Texas

AMARILLO, TEX.—Fredell Construction Co., 206 Polk street, Amarillo, Tex., has been given a contract to build an 18-inch pipeline, 60 miles, from Owatonna, Minn., to St. Paul, Minn., for the North American Oil & Gas Co.

DALLAS, TEX.—Dallas Tank & Welding Co. has been incorporated with $2000 capital by M. L. Vickery, Santa Fe building, Dallas, Tex.

DALLAS, TEX.—Texas Aircraft Co. has been organized to build airplanes, by C. J. Griffin, president, care chamber of commerce.

HOUSTON, TEX.—Humble Oil & Refining Co., Houston, Tex., has let contract for construction of a repressuring plant in the Hilbig field, Bastrop county, Texas, costing about $75,000.

FORT WORTH, TEX.—Southwestern Greyhound Lines has consolidated headquarters at Fort Worth, Tex., necessitating enlargement of machine shops here. Jack Knutson, 821 West Rio Grande street, is manager of operations.

KILGORE, TEX.—Hiotane Refining Co. has been incorporated with $50,000 capital to build and operate an oil refinery, by H. M. Harrington, president.

RANDOLPH FIELD, TEX.—Construction quartermaster, Fort Sam Houston, Tex., will take bids soon for improvement at Randolph Field, including gasoline storage system, $19,000; oil storage system, $15,000; post prison, $125,000; warehouses, $160,000; and other structures, $140,000.

WAXAHACHIE, TEX. — Byrd Air Cooler Co. has been incorporated with $150,000 capital to manufacture air-conditioning equipment, by R. J. Byrd, president.

Wisconsin

MEDFORD, WIS.—Medford Brewing Co. is erecting the first unit of its 2-story brewing and bottling works, 40 x 120 feet, and will build a second unit the same size early in 1934. Richard Seuberlich is president.

MILWAUKEE—This city has been granted $4,600,000 federal aid for construction of a water filtration plant. Plans are being drawn by Alvord, Burdick & Howson, consulting engineers, Chicago. Joseph P. Schwada is city engineer.

MILWAUKEE—Louis V. Shaw, associated with the local tool and die industry for many years, has incorporated the Shaw Tool Co. with 500 shares no par value, with temporary offices at 8133 Woodland avenue, Milwaukee.

RACINE, WIS.—Klinkert Brewing Co. has been incorporated with $500,000 capital to build a brewery costing $300,000 at Eighth street and Washington avenue, with capacity of 200,000 barrels per year. Plans are by Herbst & Kuenzli, 1249 North Franklin place, Milwaukee.

SHEBOYGAN WIS. — Bids will be asked soon for construction of a vocational school for which a federal loan and grant of $307,630 has been made available. Plans are by E. A. Steubenrach, 809 North Eighth street, Sheboygan, Wis.

WAUSAU, WIS.—Underwood Veneer Co., C. C. Lemke, general manager, will build an L-shaped mill addition 38 x 80 and 32 x 48 feet, costing about $40,000. Plans are by Oppenhamer & Obel, architects, Wausau, Wis.

Colorado

DENVER—Water board has received allocation of $3,500,000 from PWA for water diversion project to bring water from Fraser river through pioneer bore of Moffatt tunnel, including lining of tunnel. Work to start as soon as funds are available. D. D. Gross, City and County building, Denver, is engineer in charge.

Pacific Coast

ONTARIO, OREG.—General Construction Co., Seattle, is low bidder at $98,007 for construction and lining of a tunnel in connection with the Owyhee reclamation project.